VSB – TECHNICAL UNIVERSITY OF OSTRAVA
FACULTY OF ECONOMICS

DEPARTMENT OF FINANCE

Srovnání efektivnosti bank v Číně a Spojených státech amerických
Comparison of Bank Efficiency in China and the United States of America

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1. Introduction
2. Characteristics of the Selected Banking Sectors
3. Description of the Evaluation Methodology of Banks
4. Comparison of Selected Banks in China and the United States of America
5. Conclusion

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The declaration

"Herewith I declare that I elaborated the entire thesis, including all annexes, independently."

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1 Introduction

Banking, one of the most profitable industries, has always been concerned. In this thesis, we will take a close look at the banking industry and evaluate the efficiency during its developments.

The aim of this thesis is to compare selected banks efficiency in China and the United States of America from 2008 to 2012.

We will choose ten banks at all, five banks from each country, mainly according to the assets size. And we will use financial ratios to analyze and compare the performances for the chosen ten banks during the selected period.

This thesis contains five parts at all. The first part will be introduction, where a clue of the thesis is going to be introduced.

In the second part, banking will be introduced from a fundamental point about the generation, the core function, the evolution and the types. Then, there will be a brief description of banking in China and the United States, which contains the banking structure and regulation on banking system.

In the third part, there will be the description of the evaluation methodology of banks, which refers to most commonly used financial ratios. All these ratios will be from six parts, profitability ratios, liquidity ratios, activity ratios, marketability ratios, financial leverage ratios and asset quality ratios, which reflect the banks' efficiency in different point of views.

In the fourth part, there will be the detailed analysis according to different ratio results. A large number of the ratios introduced in the third part will be used to compare the efficiency of chosen banks from China and America. Then, a summary will be included to show the main results from the comparison.

The fifth part will be conclusion that we will summarize the main results what we get from the thesis.

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2 Characteristics of the Selected Banking Sectors

The development of the world is closely related to the development of economy, while the development of economy relies on well–functioning financial markets. *"Activities in financial markets have direct effects on personal wealth, the behavior of businesses and consumers, and the cyclical performance of the economy". (MISHKIN, 2013)* Banks, the most important financial institution, are what make financial markets work. Thus, banks play a crucial role in the development of economy.

2.1 Meaning of banking

"A bank is a financial intermediary whose core activity is to provide loans to borrowers and to collect deposits from savers". (CASU, 2006) In other words, banks are channeling funds from people who have saved surplus funds by spending less than their incomes to those who have a shortage of funds because they wish to spend more than their income. And this is the essential economic function of financial markets realized primarily by banks. Through channeling funds, financial markets increase economic efficiency by promoting a better allocation of resources, hence, increase the economic welfare of everyone in society.

Actually, there are two ways of moving funds, direct finance and indirect finance. Direct finance means that borrowers obtain funds directly from lenders in financial markets, while indirect finance involves financial intermediaries, usually banks, who help transfer funds from lenders to borrowers by borrowing funds from lenders and then using these funds to make loans to borrowers.

Usually, financial claims are generated when an act of borrowing takes place, which are claims on the borrower's future income or assets. For example, companies raise funds through direct finance by selling securities to lenders, and the securities are assets for lenders who buy them, but liabilities for the companies who issue them. What's more, a security entitles the owner to a share of the company's profits and assets.

Even though direct finance relates to the stock market, on which the media focus much of their attention, banks, as financial intermediaries, are far more an important source of financing. Without financial intermediaries, it would have difficulty and expense of matching

the complex needs of individual borrowers and lenders, and the incompatibility of the financial needs of borrowers and lenders.

From lenders' point of view, they want to minimize the risk of default and the risk of the assets dropping in value, reduce their costs and prefer holding assets that are more easily to converted into cash, which usually refers to short-term assets. As borrowers, they want to get funds at a particular specified date and keep it for a specific period of time, which usually refers to long-term liabilities. At the same time, they will bargain for the lowest possible cost.

Banks, as financial intermediaries, can bridge the obvious contradiction between borrowers and lenders and reconcile their often incompatible needs and objectives, which means lenders want to lend their assets for short periods of time and for the highest possible return, in contrast, borrowers demand liabilities that are cheap and for long periods. Banks can do so by performing a transformation function: size transformation, maturity transformation and risk transformation.

Usually, deposits are small-size, but banks can repackage them into larger size loans by exploiting economies of scale associated with the lending/borrowing function, because they have a larger number of depositors than borrowers. And funds with short period of time can be transformed into long term loans by banks, because banks are borrowing short and lending long. What's more, banks can minimize the risk of individual loans by diversifying their investments, pooling risks, screening and monitoring borrowers and holding capital and reserves as a buffer for unexpected losses.

Meanwhile, banks can take advantage of economies of scale and economies of scope to reduce transaction costs, as well as to avoid the problems derived from asymmetric information, which includes adverse selection and moral hazard, principal-agent problems and free-rider problem.

2.2 The evolution of banking

Banks and banking have been around for a long time. *"Banks make profits by charging an interest rate on their loans that is higher than the one they pay to depositors". (CASU, 2006)* This is the main part of their profits which is unchanged from ancient times to the present. Now they also charge fees and commissions from non interest activities.

In early times, people with a lot of money paid some fees to store their money in safe vault. Later, some bold people started to lend money to those who need it in a rush and charged them with an interest return, that's because they would worry about the safety problem to store money at home. Then some people spent a lot of money to build a big and safe vault, at least it looked like. The owner of the vault promised a low interest return to people who would store their own money in the vault and the availability to withdraw their money at any time, while they lent the money to someone else in need, asking for a high interest. This is how banking started.

Depositors put their money in a bank, and in return they received a certificate stating the time and the amount of money they deposited in the bank. As time goes by, deposit certificates could be used to make payments. Initially, it's a so cumbersome process that people have to pay money in gold form when they need a large amount of them. The concept of using deposit certificates for payments further evolved into notes, checks and other methods to conveniently withdraw deposits from the bank.

What makes banking different from other businesses is that banks use money as product. In this way, the evolution of banking sector strongly connects with money, to be exact, the payments system. The payments system has been evolving over centuries. *"At one point, precious metals such as gold were used as the principal means of payment and were the main form of money. Later, paper assets such as checks and currency began to be used in the payments system and viewed as money". (MISHKIN, 2013)* Nowadays, people use cheap and easy electronic payment a lot due to the development of inexpensive computers and the spread of the Internet.

During its long existence in the history, the products and services offered by banks have changed a lot. In spite of the variation among banks, the core services that banks traditionally provide are collecting deposits, making loans and payment services. With the evolvement of banking, the complexity of the three core banking functions has increased. Collecting deposits is the process of accepting cash or money (deposits) from individuals and businesses (depositors) for safekeeping in a bank account, available for future use. Making loans is the process of evaluating and deciding whether a customer (borrower) is eligible to receive a loan or credit and then extending the loan or credit to the customer. Payment services are the process of accepting and making payments on behalf of the customers using their bank accounts.

Due to the development of technology, people use cars, trains and airplanes to travel, and write emails, use phones to communicate with others, and the way people get information doesn't rely on face to face any more, they choose Internet. Things become more convenient and available, while society information is more and more transparent and accessible. All these stuffs change the people's behavior; they want more convenient and faster services. It is not enough for an institution to be called a bank in a modern economy now. Banks change its strategy to fulfill the customers' needs.

From commodity money to fiat money to checks to plastic cards to e-money, banks are always following the change of money forms. Banks not only open a lot of branches in different regions, but also start the expanding of Internet banking, and some even contain the investment, pensions and insurance services. And banking industry is subject to regulatory supervision by banking regulator, for example central bank. Banks adopt the "reserve requirements" to reach the reserve rate and prepare some extra reserve for better liquidity, and some even pay the deposit insurance in some country. *"Multiple forces shape the banking industry, including regulation, competition, product innovation, changing technology, and the uncertainty surrounding future interest and inflation rates". (APOSTOLIK, 2009)*

There is a trend towards Bancassurance since late 20th century. Some of the reasons put forward to explain such a trend are: banks can get cross-selling opportunities from scope economies; non-interest income boosted at a time of decreasing interest margins; risk diversification especially when banking sector is not in a good situation; the deregulation and financial liberalization give banks chances to convert into full service financial firms. In short, banks are getting larger and larger, and the products and services they provided are becoming more complex and wider range.

2.3 The types of banking

A lot of banks exist in different parts of the world, people can distinguish them from each other by their characteristics, such as the types of customers served, the range of services offered, the sizes of capital owned and so on. This section illustrates different types of banks from different points of views.

Usually, according to the types of customers served, banks can be divided into **retail banks**, **wholesale banks** and central banks.

Retail banks' primary customers are individuals, or "consumers". It's also known as personal banking, usually small scale in nature and have a small network of local branches. Retail banks usually offer a range of personal banking service including payments service, savings, loans, mortgages and other services. But they may have different specializations, like **savings and loans banks** and **credit unions**, **private banks** and **postal banks**.

Savings and loans banks (thrift, building societies) and credit unions always make loans to individuals to finance house, car or other purchases (e.g., AIG Retail Bank in Thailand, Woodlands Bank in the United States). Private Banks concern the high quality provision of a range of financial and related services to wealthy clients, principally individuals and their families. In addition to the basic services of retail banking, private banks provide wealth management services including tax and investment advice. They tailor services to individual client requirements, orientate to build long term relationship with customers, seek personal contact, and anticipate client needs (e.g., Rothschild in Europe, HSBC Private Bank in Hong Kong, and Citigroup Private Bank in the United States). Postal banks offer banking services to customers in post offices, usually the postal service owns or collaborates with a bank, and nowadays people often pay utility bills (electricity, gas, water bills) through them (e.g., Postbank A.G. in Germany, Japan Post Bank in Japan).

Wholesales banks' customers are primarily companies, and they offer different banking services according to the size of firms, the range of financial products and services on offer increases and grows in complexity the lager the company, like **investment banks**. It's also known as corporate banking. For the small firms, they mainly offer payment services, debt finance, equity finance and some special financing. It's somehow similar to those provided to retail customers but on a larger scale. Comparatively, large firms can get even more help than small companies in foreign exchange and interest rate related transactions, securities underwriting and fund management services.

Investment banks mainly deal with large companies and other large institutions and they typically do not deal with retail customers. And investment banks can't be named as "bank" if people consider about the basic three functions of banking. The main role of investment banks is to help the clients raise funds in the capital markets either through the issue of securities (stocks or bonds). Typically, they offer mergers and acquisitions, asset

management, underwriting, trading and investing in securities, initial public offering and other securities services. The world famous investment banks are on Wall Street, such as Citigroup, Morgan Stanley, and Goldman Sachs and so on.

Central banks are the principal monetary authority of a country or a group of countries and crucial to the functioning of all banks, financial markets and the economy. They are focusing on the behavior and operation of banks. Their daily activities contain buying and selling government debt, determining and maintaining interest rates, setting reserve requirement levels, issuing currency, regulating and supervising banks and arranging payments between banks. Some central banks are also charged with maintain certain foreign exchange rate levels for the home currency. Central banks are existed to ensure the safety and soundness of its country's financial system. For example, the European Central Bank (European Union), the People's Bank of China (China), and the Federal Reserve System (United States).

And we can also classify the banks by the size of bank assets. Small banks belongs to the companies with less than $1 billion in bank assets, medium sized banks to those with $1 billion to $25 billion in bank assets and large banks with more than $25 billion.

Based on location, there are **community banks**, **joint stock commercial banks** and **international banks**. A bank with small size which is devoted principally to consumers in one specific geographic area such as a city or a region of country is a community bank. It's often referred to as a retail bank and it's the best choice for people who hardly go out of the city. It's also known as municipal commercial bank. Joint stock commercial banks and international banks are referred as to wholesale banks. Joint stock commercial banks own a lot of branches across the country and have strong capital, while international banks finance international trade and have representative offices or small branches in several countries. International banks are also known as multinational banks or global banks.

There is a clear difference between **universal banks** and **specialist banks** whether a bank can offer services of commercial and investment banking at the same time. Universal banks offer financial services including investment, pensions and insurance services, along with the core banking functions, while specialist banks have the institutional separation of commercial and investment banking. And universal banks can use the advantage of distribution alliance or conglomerates to cross sell many different products and services to customers through the product lifecycle.

Because of the difference in country's law, religion and policy, there are some special banks, like Islamic banks which do not charge or pay interest. Anyway, it's not necessary to assess a bank with some certain marks. Today, more and more banks become market driven and sales oriented to satisfy the changing demands of their customers and improve their competitive ability, so banks will try to offer as many products and services as possible. Usually, banks will try to collect more deposits to make loans, and occupy more market shares. After all, banking sector is a sector with small profits but quick turnover. There will be a trend that large banks become larger and more international, small banks are going to be more focused and convenient for local customers. And these banks will complement with each other.

2.4 Banking in China

China is walking quickly but stably on its banking development road. Since the economic reform of China in 1978, China has built the modern banking system to serve the national economy. In its way of progressing, it has achieved a lot of success and got a lot of attention, even during the financial crisis, banking in China was the most profitable bank in the world.

2.4.1 Chinese banking structure

Chinese government prohibits any institution from acting as any combination of an investment bank, a commercial bank, or an insurance company. As a result, Chinese banking system consist of the central bank, regulator, self-regulatory organization and banking institutions.

Under the leadership of the State Council，**People's Bank of China (PBC)**，the central bank of China, is responsible for formulating and implementing monetary policy to prevent and defuse financial risks and maintain financial stability. **China Banking Regulatory Commission (CBRC)** is responsible for national banking financial institutions and their activities regulation. **China Banking Association (CBA)** was registered in the Ministry of Civil Affairs as national non-profit social organization, is the self-regulatory organization of Chinese banking system.

State-owned commercial banks, also known as the large state-controlled commercial banks, are directly held by the state holding as the first shareholder (Ministry of Finance, the Central Huijin company). Among them there are 5 banks now, they are Industrial and Commercial

Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank, and Bank of Communications.

Joint-stock commercial banks are the national joint-stock commercial bank approved by the People's Bank of China, which can carry out financial business in the country. There are 12 banks of them.

Urban commercial banks are existed to provide financial support for small and medium sized enterprises, and to pave a way out for the local economy bypass. They usually have an amount of asset less than 20 billion CNY, and 70% of them have an amount of asset less than 10 billion CNY. There are 144 banks of them.

Rural commercial banks are local financial institutions composed by farmers, rural businesses, business entities and other economic organizations within its jurisdiction. Till the end of 2012, there are 337 banks. Rural cooperative banks are composed of shares of shares jurisdiction farmers, rural businesses, corporate and other community-based cooperative economic organizations of local financial institutions. These banks are a little bit less than the former ones, there are 147 till the end of 2012. But all rural cooperative banks will transform into rural commercial banks someday.

Rural Credit Cooperatives, been approved by the People's Bank of China, is composed of members shares, democratic management, primarily for members to provide financial services to the rural cooperative financial institutions. There are 1927 banks.

In 1994, in order to meet the needs of economic development and implement the principle of separating the policy finance and commercial finance phase, China formed three policy banks, the National Development Bank, the Export-Import Bank of China, Agricultural Development Bank of China, which were directly under the State Council. Then, China Postal Savings Bank was formally established on March 20, 2007, was based on the reform of the postal savings management system established commercial banks. The last one is foreign banks, which are foreign-owned banks in the territory. There are 42 of them.

2.4.2 Regulation of Chinese banking system

In Chinese banking system, there are three regulators, China Banking Regulatory Commission (CBRC), People's Bank of China (PBC) and China Banking Association (CBA).

China Banking Regulatory Commission (CBRC) is the main regulator of the banking system. The regulatory objectives of the CBRC is to protect the interests of depositors and consumers through prudential and effective supervision, to maintain market confidence through prudential and effective supervision, to enhance public knowledge of modern finance though customer education and information disclosure, and to combat financial crimes. The main functions of the CBRC include:

- *Formulate supervisory rules and regulations governing the banking institutions;*
- *Authorize the establishment, changes, termination and business scope of the banking institutions;*
- *Conduct on-site examination and off-site surveillance of the banking institutions, and take enforcement actions against rule-breaking behaviors;*
- *Conduct fit-and-proper tests on the senior managerial personnel of the banking institutions;*
- *Compile and publish statistics and reports of the overall banking industry in accordance with relevant regulations:*
- *Provide proposals on the resolution of problem deposit-taking institutions in consultation with relevant regulatory authorities;*
- *Responsible for the administration of the supervisory boards of the major State-owned banking institutions; and Other functions delegated by the State Council;*[1]

The People's Bank of China (PBC) was established on December 1, 1948 based on the consolidation of the Huabei Bank, the Beihai Bank and the Xibei Farmer Bank. In September 1983, the State Council decided to have the PBC function as a central bank. Except of functioning as a central bank, PBC also has the responsibility to regulate financial markets, including the inter-bank lending market, the inter-bank bond market, the foreign exchange market and the gold market.

China Banking Association (CBA) aims at promoting the realization of the common interests of the member for the purpose of self-fulfillment, human rights, coordination and service functions, safeguarding the legitimate interests of the banking industry to maintain market order, improving the quality of banking employees and the level of services for members, as well as promoting the healthy development of the industry.

[1] The main functions of the CBRC were achieved from the website of CBRC, http://www.cbrc.gov.cn.

Till the end of 2012, there is no deposit insurance system in China, but this is the ongoing way for China. Deposit insurance is provided to protect depositors from the loss of their funds and to eliminate the possibility of a "run on the bank" if rumors spread about a particular bank. *As of 2011, one hundred and seven countries currently provide some form of deposit insurance, according to the International Association of Deposit Insurers (IADI). China does not insure its deposits, but according to the IADI, that country and 23 others have systems pending or are planning to create deposit insurance. Hong Kong, which is a special administrative region under the sovereignty of China, does have deposit insurance for its banks.*[2]

2.4.3 Payment system in China

China National Advanced Payment System (CNAPS), been created by People's Bank of China in accordance with customers payment and settlement needs, and the use of modern computer technology and self-development and construction of communication networks, it is possibly efficient and safely handling of each bank for off-site, a variety of payment operations and its capital city of liquidation fund clearing applications and money market transactions. The CNAPS is the banks and public payment and settlement platform for the currency market, the People's Bank of its financial services plays a core functions supported by the system.

2.5 Banking in the United States

The Unite States, with the world's strongest economy, has established a complex, systemic, advanced and accomplished banking system through its more than 200 years history. The way the system evolved has become a model for other countries to study on. Till today, there are three main types of financial institutions (depository institutions, contractual savings institutions and investment intermediaries) operating under the system and three main regulators （**Office of the Comptroller of the Currency (OCC), Federal Reverse System (FRS) and Federal Deposit Insurance Corporation (FDIC)**） supervising the operation to build a safe and sound banking environment.

[2] Cited from http://www.investopedia.com/articles/economics/11/chinese-banking-system.asp.

2.5.1 U.S. banking structure

Banking in the United States is the most advanced one in the world, not only because of the various products and services, but also the mode it functions in. There are a lot of different financial institutions functioning in the system, in which there are three main groups: **depository institutions, contractual savings institutions and investment intermediaries**. Each of them plays a crucial role in smoothing the banking system.

Depository institutions contain **commercial banks, savings institutions and credit unions**. All these depository institutions primarily provide basic banking services like collecting deposits, and making loans and payment services.

Commercial banks are the major financial intermediaries in the banking system. They serve as retail banks for individual customers or wholesale banks for corporate customers. Either listed in a stock exchange or be owned privately, these banks can focus on a specific geographic area or have a lot of representative offices around the country. Commercial banks are various and different, without a doubt, they are suitable for different people with different needs.

Saving institutions refer to the so called Savings and Loan Associations (S&Ls) or the thrifts. Savings and Loan Associations focus on assisting people with home ownership and making mortgage loans on residential property, also known as home financing institutions. Compared to commercial banks, a main difference with the saving institutions lies in their ownership, that the latter one is usually mutually held. It means lenders and borrowers have voting rights to decide the financial and managerial goals of the institution. It can either be publicly traded or mutually held. However, once it went public, it didn't have a mutual ownership any more.

Owned by their members, credit unions are nonprofit and tax exempt institutions. They are usually community orientated and aimed to serve their members rather than maximize profits. Credit unions are financed by the deposits of the member, meanwhile, they do not rely on donations like other not for profit organizations. What's more, the members can elect their board of directors in a one-person-one-vote system, regardless of the money they invested.

Contractual savings institutions refer to insurance companies and pension funds. Their major character is they get premiums or contributions from customers and promise to pay them future benefit. There are two main types of insurance companies, life insurance and general

insurance. Life insurance is a contract between an insured and an insurer, where the insurer promises to pay a designated beneficiary a sum of money in exchange for a premium, upon the death of the insured person. While general insurance typically comprises insurances that are not determined to be life insurance, is also called property and casualty insurance. Pension funds provide retirement income (in the form of annuities) to employees covered by pension plans. They obtain their income from contributions made by employees and employers and invest these in a variety of long term securities and other investments such as property. And there is a difference between private pension funds and public pension funds. Private pension funds are pension funds that are administered by a bank, life insurance company or pension fund manager, while public pension funds are the pension provision of the government.

As for investment intermediaries, we have mutual funds and investment banks or securities companies. A mutual fund is a company that pools the money of many investors in order to invest in a range of different securities. The main attraction for investors is that mutual funds provide diversification benefits as their assets are invested in many different securities. Investment banks or securities companies are focusing on helping companies and governments raise funds through capital market. Since 1999 and the abandonment of the Glass-Steagall Act, various American commercial banks have acquired investment banks.

From the products and services that the financial institutions provided, it's quite simple to distinguish them, and we can also find an obvious difference while looking at the liabilities structure of them. From the above analysis, we can get the conclusion that depository institutions rely on deposits to finance the operation, while contractual savings institutions' liabilities are long term future benefits and investment intermediaries' liabilities are short term money market or capital market securities.

2.5.2 Regulation of the US banking system

A well functioning banking system can't exist without effective regulation. The current system for regulating and supervising financial institutions in the United States is diverse and relatively complex. At the federal level, banking are regulated and supervised by three main regulators-- Office of the Comptroller of the Currency (OCC), Federal Reverse System (FRS) and Federal Deposit Insurance Corporation (FDIC).

The Office of the Comptroller of the Currency（OCC）is an independent bureau of the U.S. Department of the Treasury. The primary mission of the OCC is to charter, regulate, and supervise all national banks and federal savings associations. At the same time, the OCC also supervise the federal branches and agencies of foreign banks to ensure that they operate in a safe and sound manner and in compliance with laws requiring fair treatment of their customers and fair access to credit and financial products. In regulating national banks and federal thrifts, the OCC has the power to:

- *Examine the national banks and federal thrifts.*
- *Approve or deny applications for new charters, branches, capital, or other changes in corporate or banking structure.*
- *Take supervisory actions against national banks and federal thrifts that do not comply with laws and regulations or that otherwise engage in unsound practices. Remove officers and directors, negotiate agreements to change banking practices, and issue cease and desist orders as well as civil money penalties.*
- *Issue rules and regulations, legal interpretations, and corporate decisions governing investments, lending, and other practices.*[3]

The Federal Reserve System is the central bank of the United States. Founded by Congress in 1913, its main aim is to provide the nation with a much safer, more flexible, and more stable monetary and financial system, largely in response to the bank panic in 1907. In addition to its monetary and credit responsibilities, the Federal Reserve has broad supervisory and regulatory authority over banks that are members of the System, bank holding companies, international banking facilities in the United States, Edge Act and agreement corporations, foreign activities of member banks, and the U.S. activities of foreign-owned banks. They also set margin requirements, which limit the use of credit for purchasing or carrying securities.

Some of these supervisory responsibilities are delegated to the Reserve Banks by the Board of Governors. These responsibilities include the conduct of field examinations and inspections of state-chartered member banks, bank holding companies, and foreign bank offices in this country and the authority to approve certain types of bank and bank holding company

[3] Cited from http://www.occ.gov.

applications. Typically, the Federal Reserve System is regulating the largest and most complex US banks and the operations of foreign banks.[4]

The Federal Deposit Insurance Corporation (FDIC) preserves and promotes public confidence in the U.S. financial system by insuring deposits in banks and thrift institutions for at least $250,000; by identifying, monitoring and addressing risks to the deposit insurance funds; and by limiting the effect on the economy and the financial system when a bank or thrift institution fails.

As an independent agency of the federal government, the FDIC was created in 1933 in response to the thousands of bank failures that occurred in the 1920s and early 1930s. Since the FDIC started insurance on January 1, 1934, no depositor has lost a single cent of insured funds as a result of a failure.

The FDIC directly examines and supervises more than 4,500 banks and savings banks for operational safety and soundness, more than half of the institutions in the banking system. Banks can be chartered by the states or by the federal government. Banks chartered by states also have the choice of whether to join the Federal Reserve System. The FDIC is the primary federal regulator of banks that are chartered by the states that do not join the Federal Reserve System. In addition, the FDIC is the back-up supervisor for the remaining insured banks and thrift institutions.[5]

2.5.3 Payment system in US

There are two main parts in the payments system of the USA, one deals with the wholesale large value payments and the other deals with retail and relatively small value payment.

There are two main networks for interbank, or large value, domestic funds to transfer payment orders. The first, named Fedwire, is a real time gross settlement system owned and operated by the Federal Reserve System. The second major wholesale payments system is known as CHIPS, the Clearing House Interbank Payments System, which is the main bank owned payments system for clearing large value payments. Typically, large value payment system operating procedures include identification, reconciliation and confirmation

[4] Cited from http://www.federalreserve.gov.

[5] Cited from http://www.fdic.gov.

procedures necessary to process the payment orders. For retail payments, now are via the automated clearing house.

3 Description of the Evaluation Methodology of Banks

In this chapter, we describe the evaluation methodology of banks. We mainly focus on the regulatory indicators and most commonly used financial ratios from six parts, profitability ratios, liquidity ratios, activity ratios, marketability ratios, financial leverage ratios and asset quality ratios, 26 indicators at all to analyze banks operation.

3.1 Profitability ratios

Profitability ratios are the most popular ratios which are used in financial analysis to evaluate a bank's ability of generating earnings while comparing to its expenses and other relevant costs incurred during a specific period of time. Here we list seven of profitability ratios which are commonly used.

3.1.1 Return on assets

Return on assets *(ROA)* is the ratio which shows how profitable a bank is relative to its assets. It's primarily an indicator of managerial efficiency, which indicates how effectively a bank's management has been in converting its assets into net income. *ROA* can be computed by using the formula,

$$ROA = \frac{net\ income}{total\ assets}, \tag{3.1}$$

where *ROA* is return on assets. *ROA* is different in different industries, and then it would be better to compare *ROA* in the same industry, or to compare *ROA* in different time period.

3.1.2 Return on equity

Return on equity *(ROE)* is the ratio which measures how profitable a bank is relative to its shareholders' equity. It is an indicator of the rate of return flowing to shareholders. *ROE* is expressed as a percentage and calculated according to the formula,

$$ROE = \frac{net\ income}{total\ equity}, \tag{3.2}$$

where *ROE* is return on assets. When a bank has a high *ROE* and keeps it stable during a certain period, it shows its high growth. Because total equity will increase with the retained earnings, if *ROE* keeps at a high level, it means net income also increases.

3.1.3 Net interest margin

Net interest margin is the main profit part of a traditional bank operation, which measures the spread between interest income and interest expense. Usually, a bank borrows at a low interest rate and lends at a higher interest rate. Net interest margin is computed by applying the formula,

$$Net\ interest\ margin = \frac{interest\ income - interest\ expense}{total\ assets}. \tag{3.3}$$

Banks all intend to maximum the net interest margin through sophisticated management by take a close control on the earning assets and seek for the possible cheapest sources of funding.

3.1.4 Net noninterest margin

Net noninterest margin, which is a primary profit supplement for a bank, counts on the amount of noninterest income which are fee and commission income from service relative to the amount of noninterest expense resulted from personnel, equipment, marketing, professional fees and so on. Net noninterest margin can be calculated by using the formula,

$$Net\ noninterest\ margin = \frac{nononterest\ income - noninterest\ expense}{total\ asssets}. \tag{3.4}$$

With the trend of merger and acquisition, banking becomes more competitive, thus net interest margin shrinks a lot. At this time, banks all try to maintain their profits by providing a large scope of services to their customers for a good net noninterest margin.

3.1.5 Net operating margin

Net operating margin is the ratio of difference between total operating income and total operating expense divided by total assets. It measures how well management and staff have been able to keep the growth of income ahead of rising costs. Net operating margin can be calculated by using the formula,

$$Net\ operating\ margin = \frac{total\ operating\ income - total\ operating\ expense}{total\ assets}. \tag{3.5}$$

Net operating margin indicates how much operating income is left over after paying for variable costs relate to assets. Generally, a healthy operating margin is required for a bank to be able to pay for its fixed costs.

3.1.6 Net profit margin

Net profit margin is the ratio of net income to total operating income. It reflects the effectiveness of expense management and service pricing policies. Net profit margin can be calculated by using the formula,

$$Net\ profit\ margin = \frac{net\ income}{total\ operating\ income}. \tag{3.6}$$

Net profit margin can indicate a bank's pricing strategy and the impact industry competition has on margins.

3.1.7 Return on capital employed

Return on capital employed (*ROCE*) is the ratio which measures a bank's profitability and the efficiency with which its capital is employed. Return on capital employed is calculated by applying the formula,

$$ROCE = \frac{earnings\ before\ interest\ and\ tax}{capital\ employed}, \tag{3.7}$$

where *ROCE* is return on capital employed, capital employed refers to the sum of shareholders' equity and debt liabilities and we can simply calculate it by using total assets minus current liabilities. Usually, we calculate *ROCE* on an average basis, which means applying the average of capital employed at the beginning and ending for the time period.

3.2 Liquidity ratios

Liquidity ratios express a bank's ability to repay its short term liabilities, commonly, refer to fulfill its customers' withdrawal demands. These ratios are stability signals of a bank, whether a bank can transfer its short term assets into cash in order to cover its short term liabilities. While banks are mainly financed by deposits, when the deposits are due, banks have to repay creditor claims, and if they fail to pay, they will be illiquidity. And illiquidity can lead to a liquidity crisis, then, it can result in a bank run, even further, a bank panic, or most serious, a contagion. In this part, we illustrate five liquidity ratios.

3.2.1 Loan to deposit ratio

Loan to deposit ratio, also known as *LTD* ratio, measures the degree of total loans to total deposits, which is the most commonly used ratio for evaluating a bank's liquidity. And *LTD* ratio can be calculated by applying the formula,

$$Loan\ to\ deposit\ ratio = \frac{total\ loans}{total\ deposits} \tag{3.8}$$

LTD ratio is a main indicator for banks' healthy operation. Generally, if LTD ratio is too low, then banks don't earn an optimal return, while if LTD ratio is too high, banks would have liquidity problem.

3.2.2 Current ratio

Current ratio measures how fast a bank can convert its current assets to cover current liquidities. Current ratio can be computed by using the formula,

$$Current\ ratio = \frac{current\ assets}{cucrrent\ liabilitie\ s}. \tag{3.9}$$

In this formula, current assets refer to cash and cash equivalents, short term investments, receivables and inventory, while current liabilities include accounts payable, current portion of term debt, accrued expenses and taxes. If a bank has a low current ratio, definitely it is not in a good financial situation. However, it does not mean that it will go bankrupt, because they can have many methods to raise money and cover the current liabilities.

3.2.3 Quick ratio

Quick ratio, which is also known as the acid-test ratio or quick assets ratio, measures how fast a bank can convert its most liquid assets to cover current liquidities. Quick ratio can be calculated by applying the formula,

$$Quick\ ratio = \frac{cash\ and\ cash\ equivalents + short\ term\ investment + accounts\ receivable}{current\ liabilitie\ s}. \tag{3.10}$$

We can find out there is only a little bit difference in comparison with the formula of current ratio, while we can just simplify the calculation process by using current assets minus inventory in the numerator. The higher the quick ratio is, the better the bank's liquidity situation is.

3.2.4 Net stable funding ratio

Net stable funding ratio is an indicator of liquidity regulation proposed by Basel Committee after financial crisis , which is used to measure the long term stable source of funding for which a bank can use to support its on- and off- balance sheet assets. Net stable funding ratio somehow force banks to use long term stable funding, while we can compute it by the formula,

$$Net\ stable\ funding\ ratio = \frac{available\ amount\ of\ stable\ funding}{required\ amount\ of\ stable\ funding}, \tag{3.11}$$

where the net stable funding ratio should not be less than 100%, available amount of stable funding is derived by multiplying the bank's equity and liabilities with some factors, which represent the proportion of the balance today that is expected to be available to the bank in one year in order to fund longer term assets, and required amount of stable funding is derived by multiplying the bank's on-balance sheet assets and undrawn contingencies and commitments with some factors, which represent the proportion of the asset balance today that is expected to be funded.

3.2.5 Liquidity coverage ratio

Liquidity coverage ratio is another indicator of liquidity regulation proposed by Basel Committee after financial crisis , which is used to ensure a bank can maintain adequate and unencumbered high quality liquid assets under the setting of severe liquidity stress scenario, and satisfy the liquidity demands for the next 30 days through covert these assets into cash. Liquidity coverage ratio is expected to compress banks' arbitrage space between short term liabilities and long term assets, and promote banks to turn back to traditional business model. We can calculate this ratio by the formula,

$$Liquidity\ coverage\ ratio = \frac{stock\ of\ high\ quality\ liquid\ assets}{net\ cash\ outflows\ over\ a\ 30\text{-}day\ period}, \tag{3.12}$$

where the liquidity coverage ratio should not be less than 100%, stock of high quality liquid assets refer to the assets which are liquid in markets during a period of stress, eligible for discounting with the reserve bank, held with sole intent as source of contingent funding and under control of the liquidity manager, while net cash outflows over a 30-day period arising from on-balance sheet items are derived by multiplying the amount of balance sheet liabilities by some factors, which represent the expected rate of funding withdrawal under stress.

3.3 Activity ratios

Activity ratios are a type of accounting ratios which indicate how quickly a bank can convert its assets into income. Activity ratios are used to measure the relative efficiency of a bank according to its utilization of assets, leverage or other such balance sheet items. And these ratios can reflect whether a bank's management has been doing effectively to generate income, if not, they can solve the problem through this way. The commonly used activity ratios for banks are the following three.

3.3.1 Asset turnover

Asset turnover is the ratio which shows a bank's assets utilization efficiency, reflects the speed from input to output during the operation period. It indicates the portfolio management policies, especially the mix and yield on assets. We can compute this ratio by using the formula,

$$Asset\ turnover = \frac{total\ operating\ income}{total\ assets}. \tag{3.13}$$

Through analyzing the asset turnover, idle assets and underutilized assets would be found, and then banks will dispose these assets to improve asset utilization efficiency and further improve the business performance.

3.3.2 Operating efficiency ratio

Operating efficiency ratio refers to the relationship between total operating expense and total operating income, which indicates the efficiency of the bank running by showing the ability how can the bank earn by using the percentage of expense to income. Operating efficiency ratio can be calculated by the formula,

$$Operating\ efficiency\ \ ratio = \frac{total\ operating\ expense}{total\ operating\ income}. \tag{3.14}$$

This ratio seeks a low value, which means the more operating income a bank earns and the less operating expense they cost.

3.3.3 Employee productivity ratio

Employee productivity ratio measures how much net operating income can be generated by a single full-time-equivalent employee and it can be computed by the formula,

$$Employee\ productivity\ ratio = \frac{net\ operating\ income}{number\ of\ \ full\ -\ time\ -\ equivalent\ employees} \tag{3.15}$$

Employee productivity ratio shows a bank's operation efficiency from every single employee's point of view, when there is a low value, which means employees didn't create the value they should. Then, some action should be taken by management to improve employee productivity ratio.

3.4 Marketability ratio

Marketability ratios measure the degree and effect of a bank's utilization on raised funds and evaluate a bank's stock performance. Investors often take marketability ratios into account to help them make investment decisions. Here we list two most popular and intuitionistic marketability ratios.

3.4.1 Basic earnings per share

Earnings per share (*EPS*) is simply the net income that is attributable to common shareholders divided by the number of shares outstanding. *EPS* is a fundamental indicator used to analyze the value per share, and it reflects the after tax profit created per share. Here we introduce the basic *EPS* which doesn't consider the potential dilutive securities, and we can compute the basic *EPS* by using the formula,

$$Basic\ EPS = \frac{net\ income\ -\ dividends\ on\ preferred\ stock}{weighted\ \ average\ number\ of\ \ shares\ outstanding}, \tag{3.16}$$

where *EPS* is earnings per share, weighted average number of shares outstanding refers to the number of shares outstanding during each month and weighted by the number of months those shares were outstanding.

3.4.2 Price to Earnings Ratio

The price to earnings ratio (*P/E* ratio) is the most used and acceptable ratio to evaluate whether a bank's stock price is reasonable. It's widely applied by investors to decide

prospective investments. *P/E* ratio is also known as earnings multiple or price multiple and can be calculated by applying the formula,

$$P/E\ Ratio = \frac{market\ value\ per\ share}{earnings\ per\ share}, \tag{3.17}$$

where *P/E* ratio is price to earnings ratio. We can also get *P/E* ratio through market capitalization of a bank divided by the profit attributable to shareholders. Generally a low *P/E* ratio means a bank is undervalued, while a high *P/E* ratio indicates that the market has a positive expectation of high growth on bank's *EPS* in the future.

3.5 Financial leverage ratios

Financial leverage ratios check the leverage degree in a bank's on- and off-balance sheet items which show on which method the bank finance its assets. As it known to us, the more leverage a bank has, the more risk the bank would bear. However, it's not always right. If a bank can borrow in a low cost from creditors, it doesn't need to spend a higher cost from raising funds by issuing equity. In this part, we take a look at five leverage ratios, while most of them are proposed by Basel Committee.

3.5.1 Equity multiplier

Equity multiplier is a ratio of a bank's financial leverage. Equity multiplier gives investors an insight of how a bank finance its assets, through equity or liabilities, and it can be computed by using the formula,

$$Equity\ multiplier = \frac{total\ assets}{total\ equity}. \tag{3.18}$$

Generally, a high equity multiplier indicates that a large portion of assets financing is being done through liabilities, thus leads to a high financial leverage and a high financial risk. The higher the leverage, the faster the equity disappears when a bank has to take losses on loans that default.

3.5.2 Risk index

Risk index (*RI*) is the ratio to measure assets and liabilities management, which shows the stability of banks, and it can be calculated by applying the formula,

$$RI = \frac{E(ROA) + CAP}{S_{ROA}}, \tag{3.19}$$

Where *RI* is risk index, *E(ROA)* refers to the expected return on assets, *CAP* refers to the ratio of equity to total assets and S_{ROA} is the volatility of assets returns. Usually, the lower the S_{ROA}, the higher the *RI*, and the more stable the bank.

3.5.3 Probability of financial insolvency

Probability of financial insolvency, known as *P(BV)*, measures the probability that a bank will have negative book value of equity. And we can compute *P(BV)* by using the formula,

$$P(BV) = \frac{1}{2 \cdot RI^2} \tag{3.20}$$

where *P(BV)* is the probability of financial insolvency and *RI* is risk index. The higher the *RI*, the lower the *P(BV)*,which shows banks' stability and low probability of financial insolvency.

3.5.4 Capital adequacy ratio

Capital adequacy ratio (*CAR*) is a ratio which reflects the degree a bank can absorb the losses by using their own capital when a bank suffers losses. *CAR* is the minimum capital ratio to ensure that banks normal operation and development proposed by Basel Committee. We can compute *CAR* by using the formula,

$$CAR = \frac{tier\ one\ capital + tier\ two\ capital}{risk\ weighted\ assets}, \tag{3.21}$$

where *CAR* is the capital adequacy ratio; tier one capital consists of common stockholders' equity, perpetual preferred stock, noncontrolling interests in subsidiaries and trust preferred securities, less goodwill and certain other adjustments; tier two capital includes preferred stock not qualifying as tier one capital, subordinated long term debt and other instruments qualifying as tier two capital, and the aggregate allowance for credit losses up to a certain percentage of risk weighted assets; risk weighted assets on– and off–balance sheet assets that are assigned to one of several broad risk categories and weighted by factors representing their risk and potential for default. And there is a restriction that tier two capital can't be greater than tier one capital.

3.5.5 Core capital adequacy ratio

Core capital adequacy ratio (Core *CAR*) is the ratio of a bank's core equity capital to its total risk weighted assets, which also known as tier 1 capital ratio. Core *CAR* is considered as a core measure of a bank's financial strength proposed by Basel Accord. We can calculate Core *CAR* by applying the formula,

$$Core\,CAR = \frac{tier\ one\ capital}{risk\ weighted\ assets}, \tag{3.22}$$

where *Core CAR* is core capital adequacy ratio, tier one capital includes equity capital and disclosed reserves, risk weighted assets include a bank's loans and securities recorded on the bank's balance sheet and also some commitments recorded on the off balance sheet. Tier one capital is a reliable bank capital to absorb losses, which is the most important banking capital assessment, while the core tier one capital level of capital is among the highest quality of bank capital.

3.5.6 Leverage ratio

Leverage ratio is the ratio which shows the relationship between a bank's core equity capital to its total adjusted assets. Leverage ratio has been adopted as a prudential tool to complement minimum capital adequacy requirements. We can compute leverage ratio by using the formula,

$$Leverage\,ratio = \frac{tier\ one\ capital}{total\ adjusted\ assets}, \tag{3.23}$$

where total adjusted assets include balance of adjusted on-balance sheet assets and balance of adjusted off-balance sheet items, tier one capital is the sum of capital and reserves deduct some intangible assets like goodwill and deferred tax assets. The adoption of leverage ratio can avoid complex measurement problems, reduce the risk of excessive leverage building up, control the excessive growth of bank balance sheets and make the capital expansion in a certain multiple of the bank's tangible capital.

3.6 Asset quality ratios

Asset quality ratios are ratios reflecting the stability of assets in case of a risk, mainly refer to the single largest risk banks face credit risk, which is the potential loss a bank would suffer if its counterparty fails to make the interest on loan or repay the principle in accordance with agreed terms. A bank's main income is from the banking book of the book, which refers to

the loans the bank has made, so the credit risk is the primary risk in the banking book. Nowadays, regulators mainly check the following three asset quality ratios to evaluate a bank's ability to deal with credit risk.

3.6.1 Nonperforming loans ratio

Nonperforming loans *(NPL)* ratio shows the relationship between nonperforming loans and total loans. It indicates the quality of credit operation and the overall stability of assets, and shows the stability and health of financial structure. *NPL* ratio can be calculated by applying the formula,

$$NPL\ ratio = \frac{nonperforming\ loans}{total\ loans}, \tag{3.24}$$

where *NPL* ratio is nonperforming loans ratio, nonperforming loans are the loans that borrowers fail to pay, or pay delayed, usually refers to the loans more than 30 days after maturity. If a loan can't be fully or partial paid by borrowers, it must be graded into a nonperforming loan and adjustments must be made to the recorded value of the loan in the financial statements.

3.6.2 Allowance to total loans ratio

Allowance to total loans ratio measures the relationship between allowance for loan losses and total loans, while in some literatures this ratio is named as Provisioning rate. It's a common method that banks use to manage the effect of loan losses, which means through allowance for loan losses to put aside some earnings as provision to cover the losses banks expect to suffer from bad loans. When there is evidence that some loan will default, the bank will make a provision to cover the losses according to the situation. Generally, banks will analyze the probability of default and expect loan losses at the end of lending period. Allowance to total loans ratio can be computed by using the formula,

$$Allowance\ to\ total\ loans\ ratio = \frac{allowance\ \ for\ loan\ losses}{total\ loans}. \tag{3.25}$$

The use of allowance for loan losses can offset the loan losses the bank incurs and reduce the bad influence on assets.

3.6.3 Coverage ratio

Coverage ratio refers to the degree of allowance for loan losses to nonperforming loans, mainly reflects a bank's ability of covering loan losses and taking precautions against credit risk. Coverage ratio can be calculated by applying the formula,

$$Coverage\,ratio = \frac{ALL}{NPL}, \tag{3.26}$$

where *ALL* means allowance for loan losses recorded on the balance sheet of the bank, *NPL* is the nonperforming loans which can't be paid as agreed on with the bank. If the coverage ratio is too high, then bank will have fake low earnings, on the other hand, when the coverage ratio is too low, it's a sign of fake high earnings.

4 Comparison of Selected Banks in China and the United States of America

In this chapter, we will use some ratios which we already introduced in the third part to compare the banking efficiency in China and the United States according to the formulas. At the beginning, we will take a brief look at the ten banks we choose, half of them are from China while the other half comes from the United States. Then, we will compare the main developments of these banks over the five years to the end of 2012 through figures. In the end, we will summarize the comparison of these ten banks.[6]

We choose five banks from each country rely on the assets size, and we choose Industrial and Commercial Bank of China (ICBC), China Construction Bank (CCB), Agricultural Bank of China (ABC), Bank of China and Bank of Communications from China. In America, we choose JPMorgan Chase, Bank of America Corporation, Citigroup, Wells Fargo and Bank of New York Mellon Corporation.

We divide all the ratios into four categories, which are profitability ratios, activity ratios, financial leverage ratios and asset quality ratios. Each of these ratios reflects banks operation and development performance in different sides.

4.1 Profitability ratios

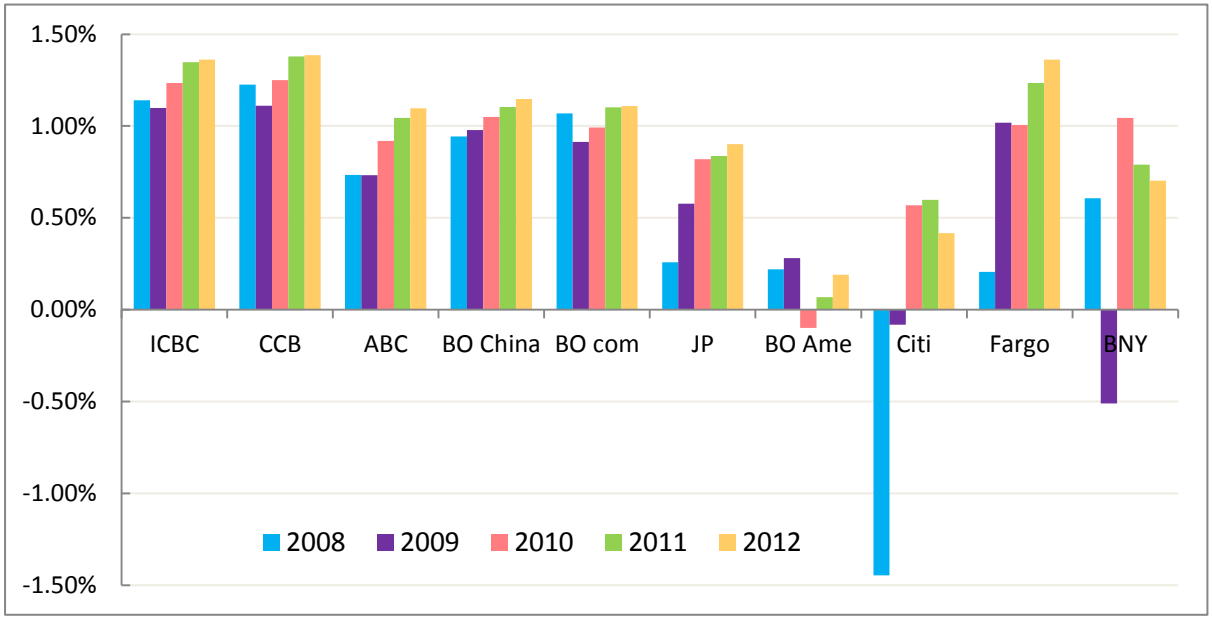
Profitability ratios show a bank's ability to generate income relate to its assets, or equity no matter what kind of income it is, net income or operating income. If a bank has a sustainable profitability over a certain period, there is no doubt that this bank is in a good and healthy financial situation, and of course it's really worthy for investors.

4.1.1 Return on assets of selected banks

Return on assets which is known as *ROA* measures the relationship between net income and total assets, and we can calculate this ratio by formula (3.1). See Figure 4.1.

[6] All financial ratios were calculated by the basic data offered by annual reports, see Annexes.

Figure 4.1: ROA of selected banks



In this figure, we can find out that *ROA* ranged from 0 to 1.5%, for those banks who did have a net income in that year from 2008 to 2012. The highest *ROA* was 1.39% achieved by CCB in 2012, while Citi got the biggest negative *ROA* of -1.45% in 2008 which was recognized as a net loss.

All banks from China had an upgoing trend, their *ROA* were around 1% and increasing year after year from 2009. ICBC and CCB were so profitable that they had an average *ROA* of 1.2%. The only drop for Chinese banks was from 2008 to 2009, which was primarily due to the fast and big growth in assets and low relative income.

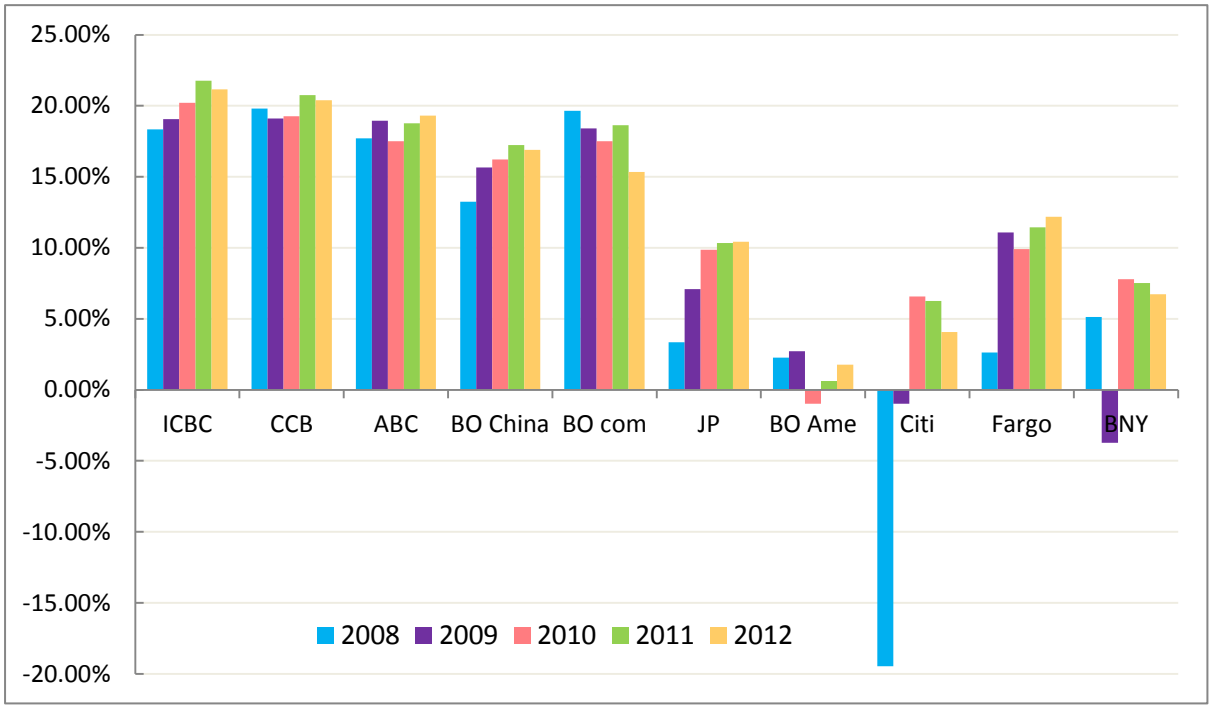
On the other hand, banks in the United Stated did suffer a lot directly from the financial crisis. Every bank had a *ROA* less than 0.5% in 2008, except BNY reached 0.61%, and especially Citi even created the biggest negative *ROA*, which was mainly caused by the loss of interest rate contracts and credit derivatives from principle transactions. However, through assets sales and portfolio run-off, Citi's net income rebounded rapidly in 2009 primarily due to the absence of significant negative revenue marks occurring in the prior year, and sustainably created *ROA* around 0.5% from 2010 to 2012. JP and Fargo both reached *ROA* higher than 0.5% in the next years, and the results kept going up. BNY had the highest *ROA* in 2008 among American banks, while it suddenly turned to be a negative value in 2009 which was primarily resulted from a charge related to restructuring the investment securities portfolio. Bank of America always kept a low *ROA* around 0.2%, and got a net loss in 2010 primarily

due to an increase in representations and warranties provision and a goodwill impairment charge.

4.1.2 Return on equity of selected banks

Return on equity which is known as *ROE* measures the relationship between net income and total equity is the return on equity, and we can calculate this ratio by formula (3.2). See Figure 4.2.

Figure 4.2: ROE of selected banks



In this figure, we can find out that *ROE* ranged from 0 to 25%, for those banks who did have a profit in that year from 2008 to 2012. The highest *ROE* was 21.76% achieved by ICBC in 2011, while Citi got the biggest negative *ROE* of -19.46% in 2008 which was recognized as a net loss.

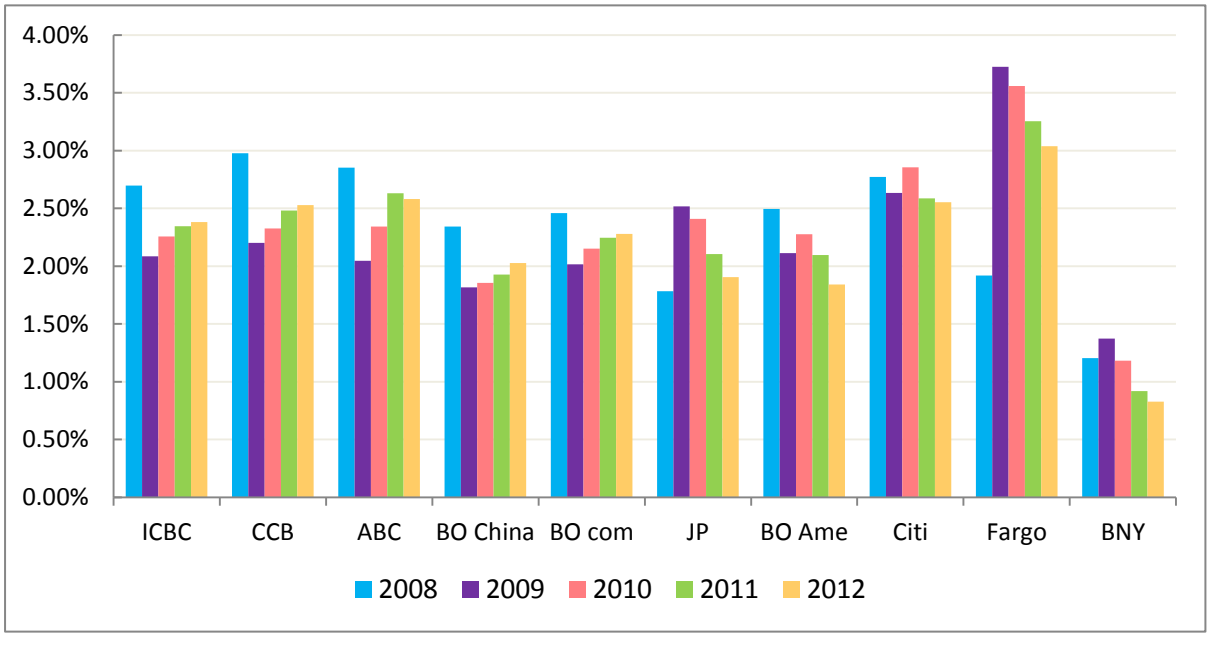
All banks from China had an upgoing trend except Bank of Communications, and their *ROE* were around 15% and quite stable from 2008 to 2012. ICBC and CCB were so remarkable that they had an average *ROE* around 20%. There was a downward curve from Bank of Communications which was resulted from the enormous growth in its equity, while there do exist a sustainable increase in net income with a lower growth rate.

JP and Fargo were obvious leaders in American banking industry that they had an average *ROE* around 10%, they did go out from the bad influence of financial crisis in 2008 as fast as they can, and made their performances back to certain level which looks vibrant and prospective. The incredible increase of Fargo from 2008 to 2009 was due to the record net income generated in that year, which was primarily due to strong trust and investment fee income and very strong mortgage banking results as the low interest rate environment produced higher levels of refinance activity. Citi's *ROE* rebounded in 2009 due to the absence of significant negative revenue marks in the prior year and Bank of America kept stable at a 2% level. Meanwhile, BNY got an average *ROE* around 6%, except the loss in 2010 resulted from a charge related to restructuring the investment securities portfolio.

4.1.3 Net interest margin of selected banks

Net interest margin measures the difference between interest income and interest expense relative to its assets, which shows the main profit source of commercial banks. We can compute this ratio by formula (3.3). See Figure 4.3.

Figure 4.3: Net interest margin of selected banks



It's so obvious that banks did have a good control on its net interest margin that the values for each bank kept quite stable from 2008 to 2012. And Fargo got the highest net interest margin of 3.72% in 2009, while lowest net interest margin of 0.83% was achieved by BNY in 2012.

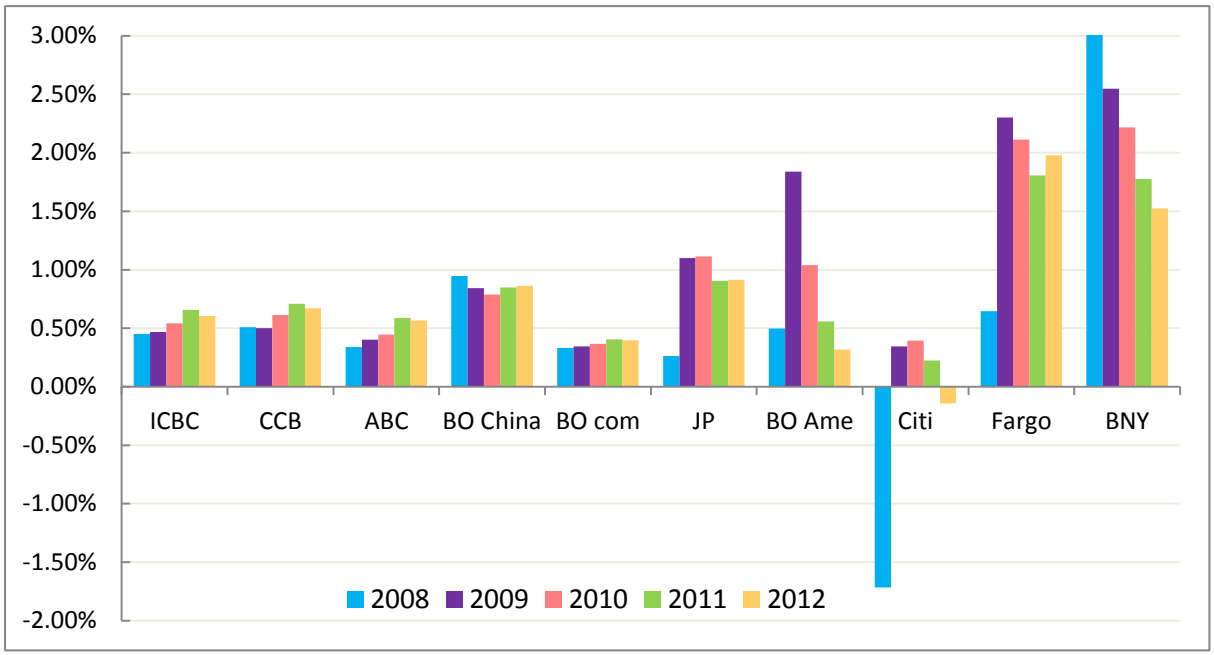
There was a simultaneous sharp decrease for banks in China that nearly every bank decreased 0.5% on its net interest margin in 2009 comparable to 2008. This is primarily because the average yield of interest generating assets had a higher decline than that in the average cost on interest bearing liabilities, which resulted in a narrowing net interest margin. Then the Central Bank had raised the benchmark deposit and lending interest rates multiple times and the impact of the increase in interest rates has been reflected gradually. At the same time, banks had optimized their asset-liability structure, particularly referred to changes in the average balances of interest bearing assets and interest bearing liabilities. And banks had further improved their pricing capability. Net interest margin turned to be larger and larger year by year due to these factors. However, banks met heavy competition from other financial institutions on collecting deposits; they had to increase the deposit interest more, which means banks paid more on its funding. And the net interest margin was not able to go back to the level in 2008 again.

Meanwhile, there was a clear downward trend in American banks' net interest margin, which was largely driven by strong deposit growth, which elevated short term investment balances, and the continued runoff of higher yielding assets. At the same time, banks in the United States paid more attention to nontraditional banking businesses like investment bank services and pensions, and they got more fee and commission from that operation.

4.1.4 Net noninterest margin of selected banks

Net noninterest margin measures the difference between noninterest income and noninterest expense relative to its assets, which is a supplement of commercial banks' profits. We can compute this ratio by formula (3.4). See Figure 4.4.

Figure 4.4: Net noninterest margin of selected banks



Here we can find a big difference from the figure that banks in the United States were quite advanced in net noninterest margin than banks in China, which means the range of products and services were more extended. The highest net noninterest margin of 3.01% was created by BNY in 2008, while Citi suffered the biggest negative net noninterest margin of -1.72% at the same time.

Banks from China had a slowly growing trend in net noninterest margin, while they had an average net noninterest margin around 0.5% except Bank of China leaded in its domestic industry with a 0.8% average. Due to the restriction of regulation, banks in China can't have a business in investment bank or insurance field. But in order to achieve a higher profitability, they actively expanded service fields with high technical contend to satisfy the changing demands of their customers and deal with the changes in the market environment. And they realized the increase in net noninterest margin from bank card business, E-banking business, entrusted wealth management services and various agency services.

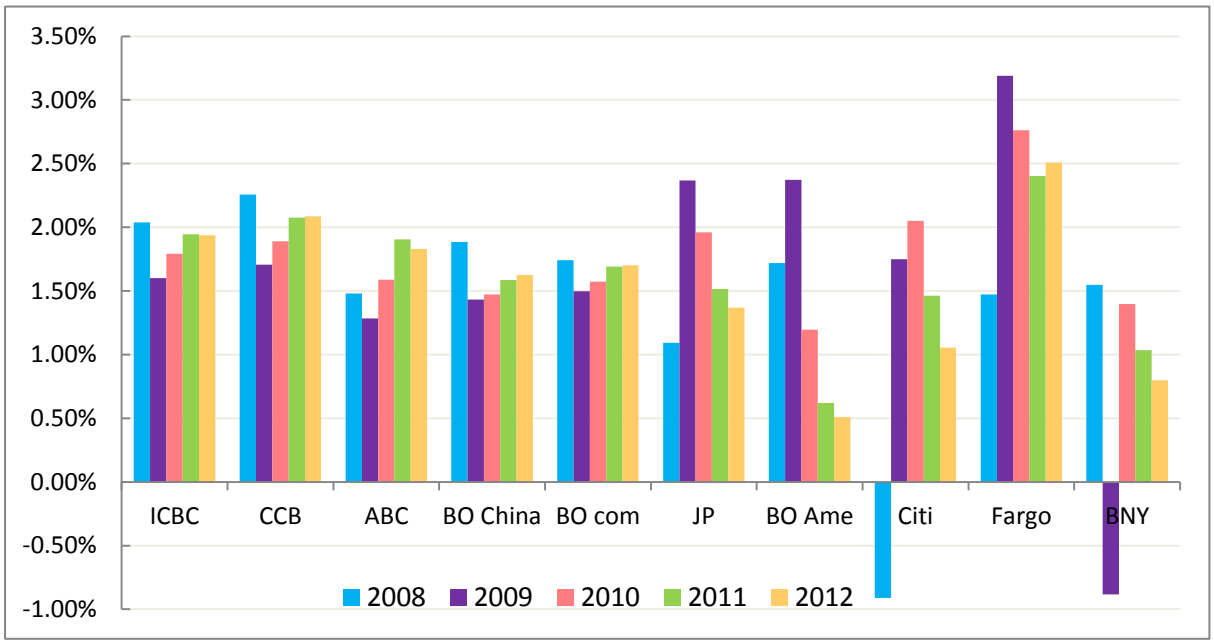
American banks benefited a lot from the mixed operation of commercial banking and investment banking. They had more sources for noninterest income, like investment banking fees, principal transactions, private pension fund and insurance businesses. Fargo and BNY both had an average net noninterest margin around 2%, while JP had an average around 1%, then followed Bank of America around 0.8%, and Citi did poor in this part even compare to

banks in China. And there was a clear trend of decreasing, predominantly due to noninterest income, which was because of the lower securities gains, lower principal transactions revenue and declines in equity and debt underwriting fees.

4.1.5 Net operating margin of selected banks

Net operating margin measures the difference between total operating income and total operating expense relative to its assets. Usually, we can use the sum of net interest margin and net noninterest margin to get net operating margin nearly. And we can compute this ratio by formula (3.5). See Figure 4.5.

Figure 4.5: Net operating margin of selected banks



Net operating margin in the banking industry reach a 1.5% average level. Fargo was no doubt the leader in the industry while it had both high net interest margin and net noninterest margin. The highest net operating margin was 3.19% which was in 2009 by Fargo, while Citi got the biggest negative net operating margin of -0.91% in 2008, mainly due to the loss of interest rate contracts and credit derivatives from principle transactions. And there was another loss from BNY in 2009 from a charge related to restructuring the investment securities portfolio.

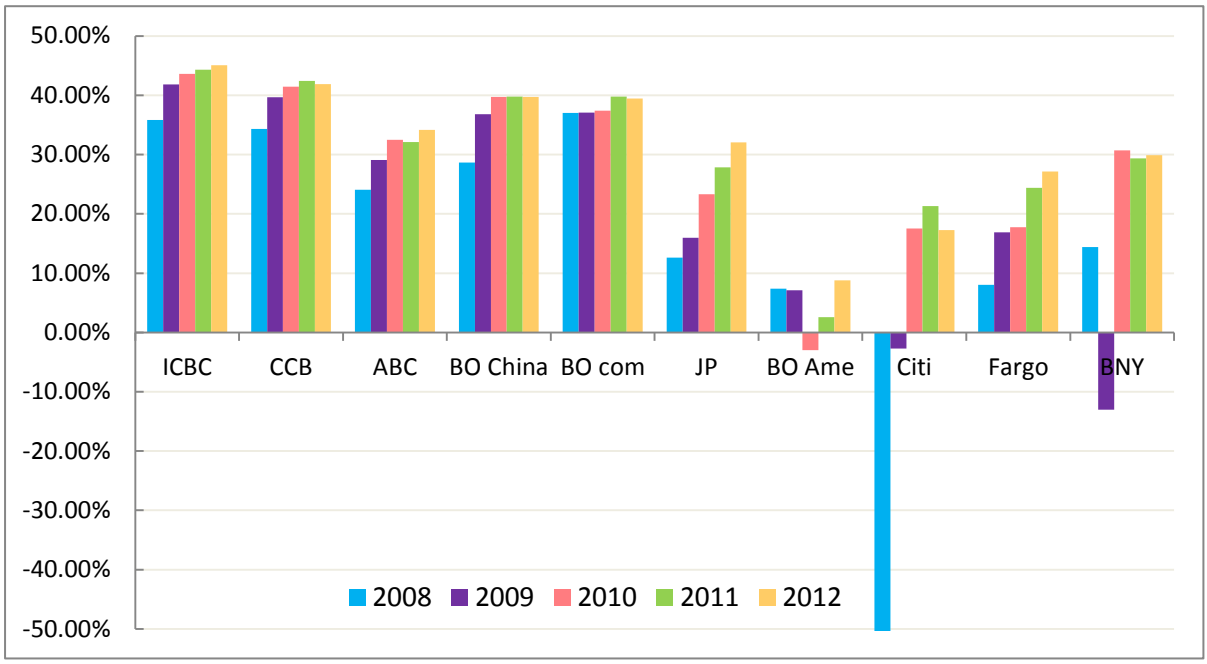
Net operating margin in Chinese banking industry showed a stable and slowing increase trend, while banks maintained the net interest margin and offered more products and services to increase more net noninterest margin.

Net operating margin in the United States markets fluctuated a lot between banks and had a clear downward trend, which was mainly because the increase in total operating expense or decrease in total operating income.

4.1.6 Net profit margin of selected banks

Net profit margin measures how much net income banks can get comparable to its total operating income and we can compute this ratio by formula (3.6). See Figure 4.6.

Figure 4.6: Net profit margin of selected banks



All banks in above were improving their control on net profit margin year by year and little by little. The largest net profit margin of 45.06% was achieved by ICBC in 2012, while Citi suffered the largest negative net profit margin of -136.7% in 2008.

Banks from China got an average of net profit margin nearly 40% except ABC who reached 30%, and these values were absolutely leading the industry. Banks improved the net profit margin through strict cost management and control, in other words, they sought lower cost funding and made wiser management to avoid loss.

Banks from America reached an average net profit margin of 20%, while Bank of America was less than 10% which was mainly because it spent more during its operation resulted in more total operating expense than its total operating income created by its large assets scale. But the banks' management did focus on reducing the cost and running business more effectively to reach the industry level. For example, the increase from 2011 to 2012 was primarily due to a significantly lower representations and warranties provision, an increase in servicing income and core production income. JP, Fargo and BNY were reaching 30% in 2012, and the increase was mainly driven by a lower provision for credit losses.

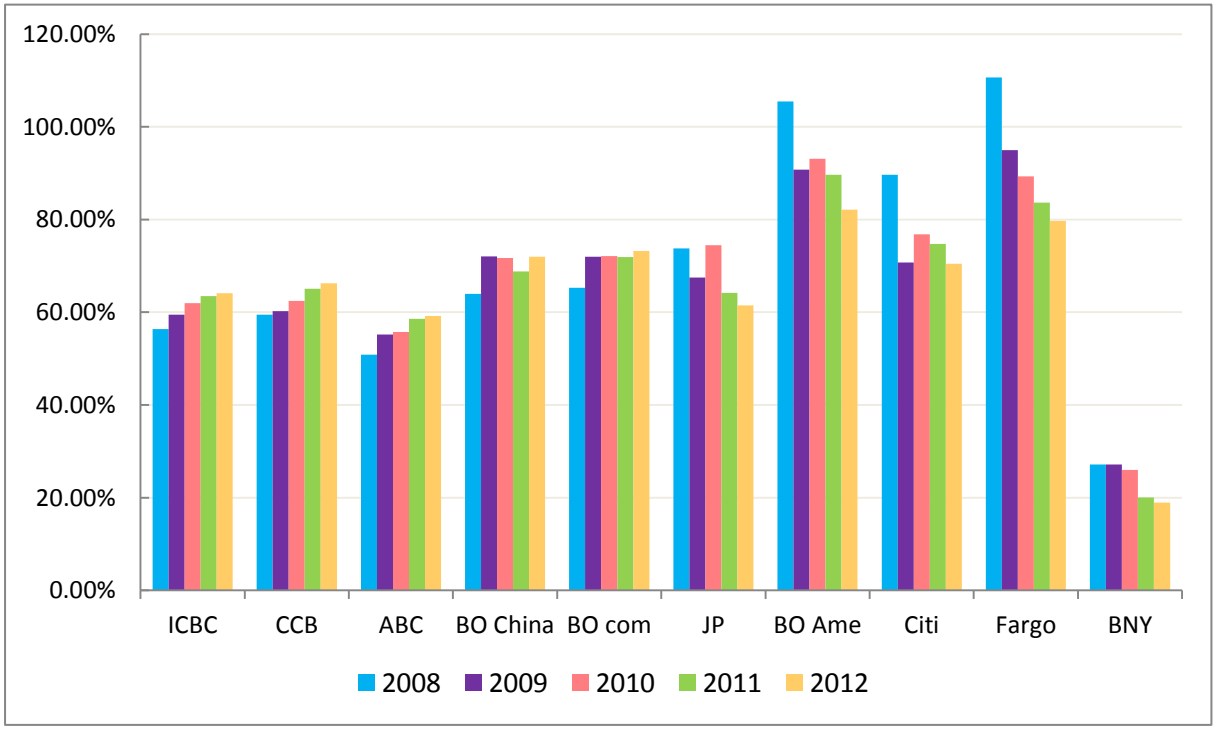
4.2 Liquidity ratios

Liquidity ratios check a bank's ability to transfer its short term assets into cash in order to cover its short term liabilities. Banks would suffer unforeseen loss when they become illiquidity, which can turn out to be a bank run or a bank panic.

4.2.1 Loan to deposit ratio of selected banks

Loan to deposit ratio, known as LTD ratio, measures the degree of total loans to total deposits, and we can calculate LTD ratio by formula (3.8). See Figure 4.7.

Figure 4.7: LTD of selected banks



We can easily find out that there was a big difference between the *LTD* ratio in China and in the United States. There was a clear regulation restriction on *LTD* ratio in China, which should not more than 75% to ensure the good liquidity, so the *LTD* ratios in China were increasing to 75% as close as they can. At the same time, banks in America had a clear decrease in *LTD* ratio, which was mainly due to the higher increase in total deposits while total loans kept the same. It's good for the regulation department to keep the *LTD* at a stable level, while if *LTD* ratio is too low, then banks don't earn an optimal return, and if *LTD* ratio is too high, banks would have liquidity problem. The highest *LTD* ratio of 110.68% was achieved by Fargo in 2008, while the lowest *LTD* ratio of 18.95% was achieved by BNY in 2012.

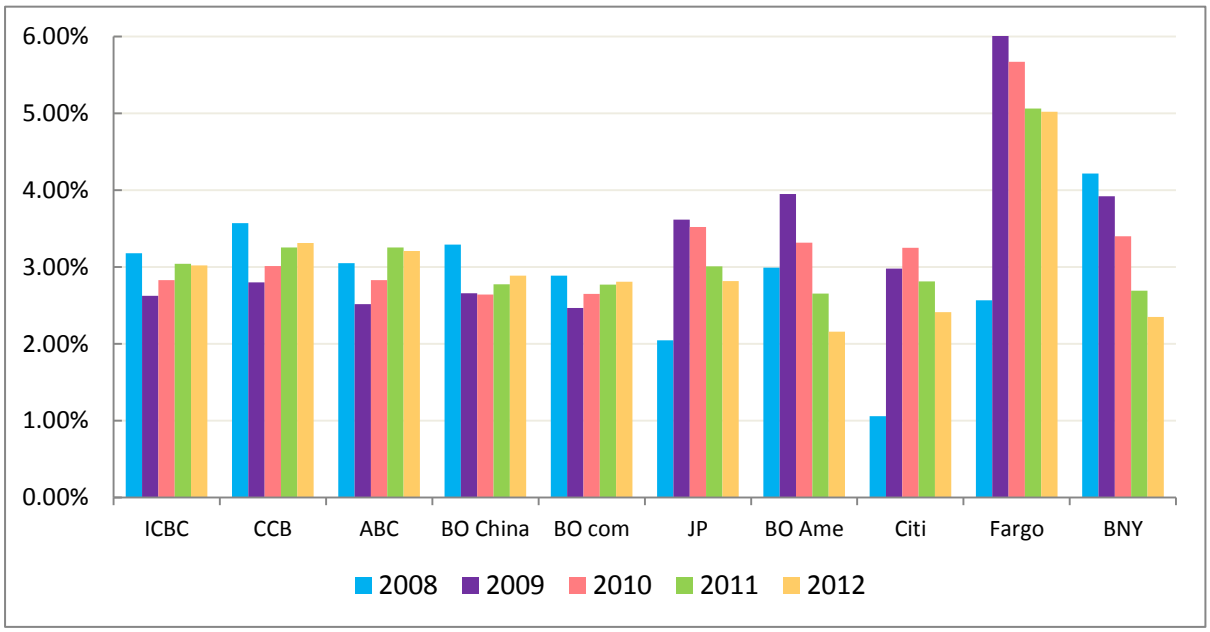
4.3 Activity ratios

Activity ratios show a bank's efficiency on using its assets and control of cost during its operation. Generally, we can know the operation health of a bank from activity ratios.

4.3.1 Asset turnover of selected banks

Asset turnover measures how much total operating income banks can get comparable to its assets and we can compute this ratio by formula (3.13). See Figure 4.8.

Figure 4.8: Asset turnover of selected banks



Asset turnover were at a 3% level, while Fargo had the highest asset turnover of 6.02% in 2009 due to strong trust and investment fee income and very strong mortgage banking results as the low interest rate environment produced higher levels of refinance activity, and Citi had the lowest asset turnover of 1.06% in 2008 mainly caused by the loss of interest rate contracts and credit derivatives from principle transactions.

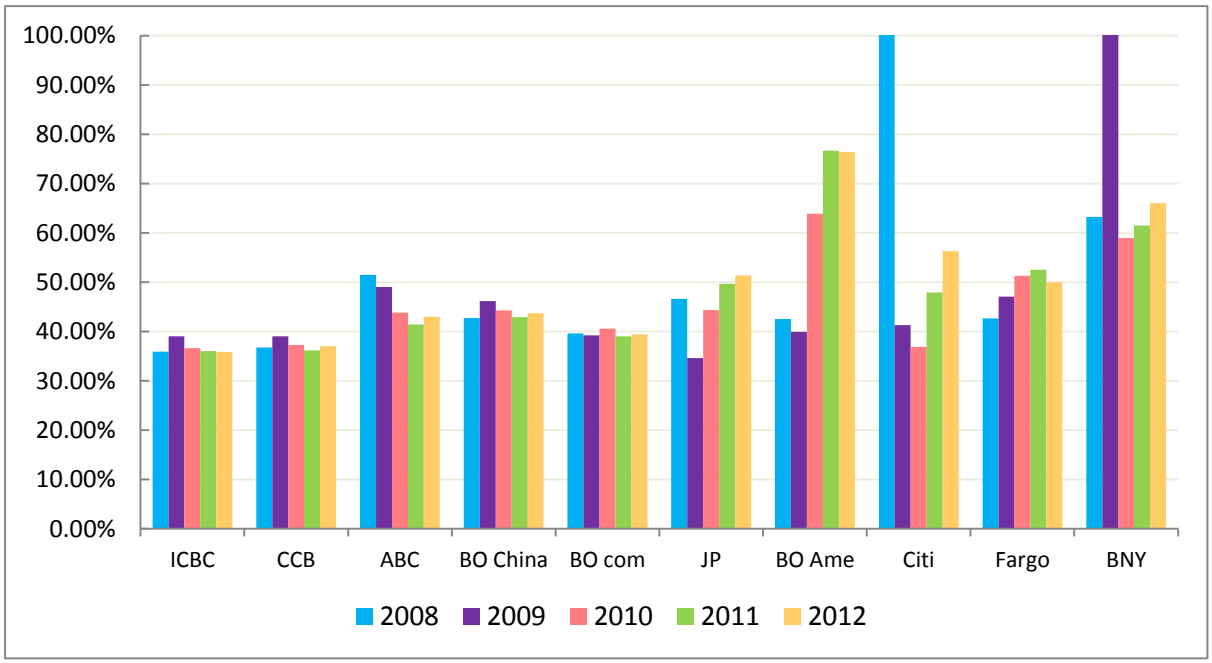
Banks in China suffered a sharp decrease from 2008 to 2009, which was mainly because of the decrease in net interest margin and high growth in assets. After that asset turnover grew up in a sustainable and slow pace and approached close to 3%. What's more important, from 2008 to 2012, there was an increase of nearly 100% in each bank's assets. While the assets were doubled, banks kept their asset turnover in a certain level around 3% and had a slow growth, which means the earning ability of Chinese banks improved a lot and the management of banks used the assets effectively.

At the same time, banks from the United States drew downward curves, which really mean the decrease of total operating income relative to their nearly unchanged assets. Almost every bank except BNY had a rapid increase from 2008 to 2009, which was mainly because these banks reduced their assets. But Bank of America increased its assets in 2009 and it got an increase in asset turnover, which was due to the increase in investment and brokerage services, equity investment income and trading account profits.

4.3.2 Operating efficiency ratio of selected banks

Operating efficiency ratio measures the relationship between total operating expense and total operating income and we can compute this ratio by formula (3.14). See Figure 4.9.

Figure 4.9: Operating efficiency ratio of selected banks



Operating efficiency ratio changed a lot from bank to bank, and the lower the ratio, the less operating expense banks cost to generate operating income per unit. The lowest operating efficiency ratio of 34.59% was created by JP in 2009, while the highest operating efficiency ratio of 186.04% by Citi in 2008.

As always, Chinese banks showed excellent stability, they were keeping operating efficiency ratio at a level around 40%， ICBC and CCB were even lower. ABC got their operating efficiency ratio down from 51.48% in 2008 to 43.01% in 2009, which was primarily due to the increase in net interest income and net noninterest income as well as the decrease in provisions for impairment losses on assets, and at the same time they control the growth degree of operating expense.

The trend of operating efficiency ratio in the United States was growing up. Operating efficiency ratio in JP and Fargo were approximately 50, while that in Citi and BNY were around 60% except the extreme data. Bank of America had an obvious increase from 42.56% in 2008 to 76.43% in 2012, which was mainly due to the increase in operating expense while operating income was decreasing.

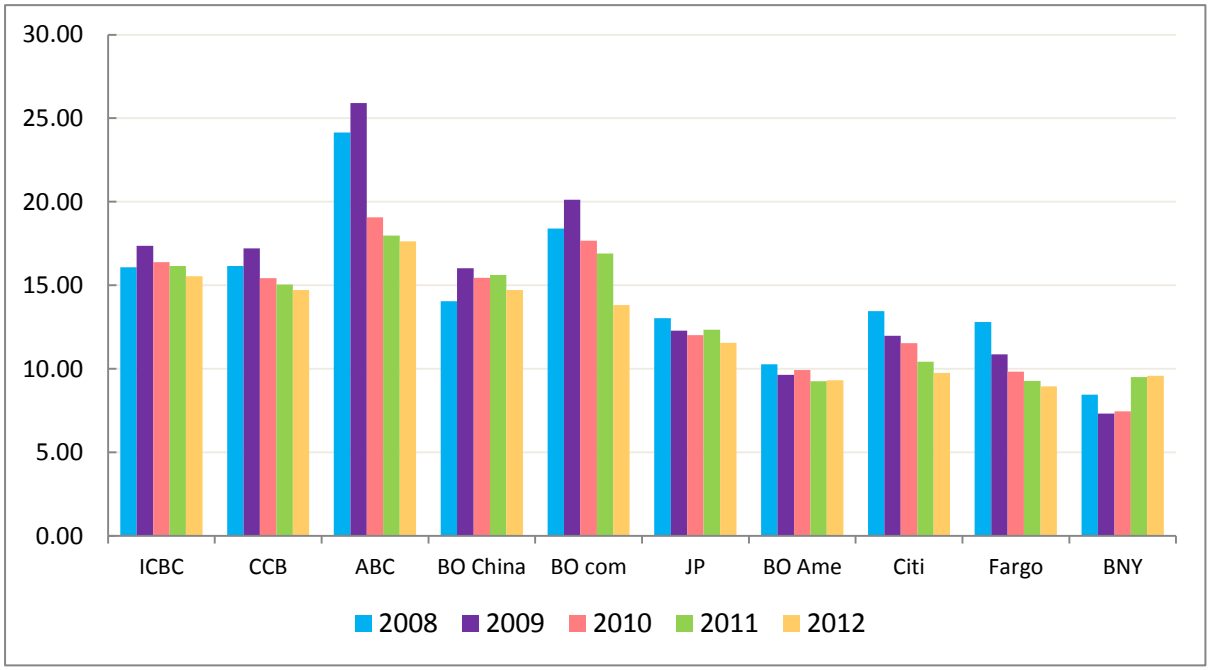
4.4 Financial leverage ratios

Financial leverage ratios check the leverage degree in a bank's on- and off-balance sheet items which show on which method the bank finance its assets and reflect the stability of bank's assets.

4.4.1 Equity multiplier of selected banks

Equity multiplier is the degree of assets to equity and we can compute this ratio by formula (3.18). See Figure 4.10.

Figure 4.10: Equity multiplier of selected banks



Equity multiplier changed from country to country, but it had a decreasing trend. From a regulatory point of view, the lower the equity multiplier, the better the stability of a bank. The highest equity multiplier of 25.9 was achieved by ABC in 2009, while the lowest equity multiplier of 7.32 was reached by BNY at the same time.

ICBC, CCB and Bank of China got an equity multiplier around 15, while the other two banks from China reached around 20. These Chinese banks were held totally by the government before it went public so that there was no need to worry about the solvency in the past. In order to help these banks finish joint stock reform, government helped them detach the bad

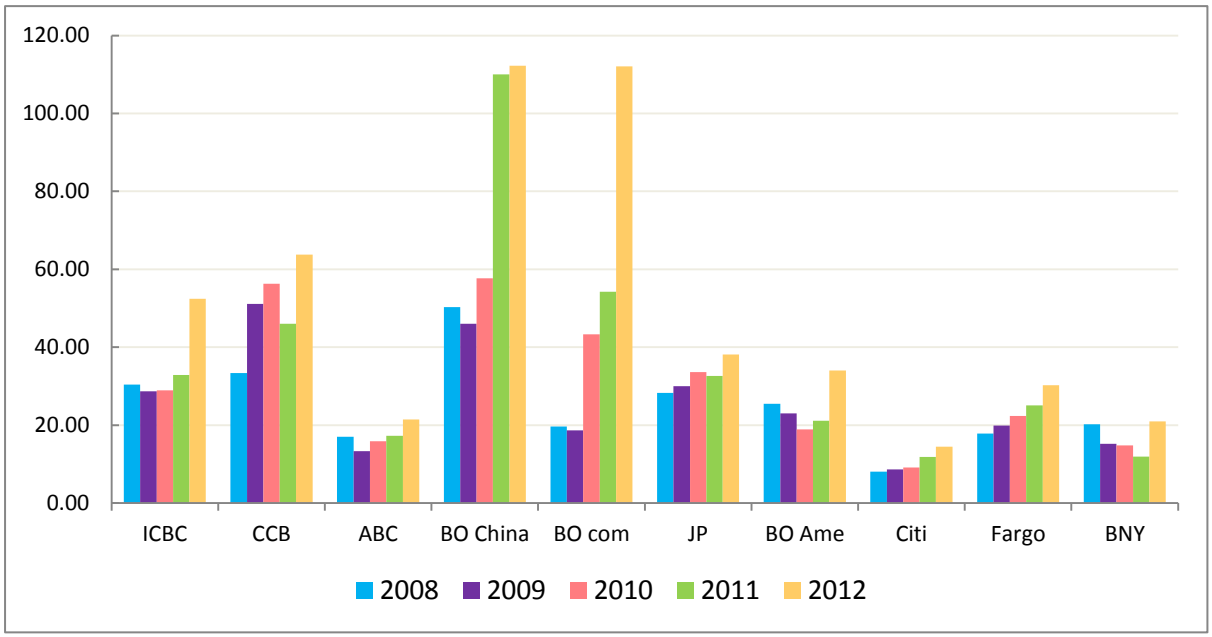
assets and inject a large amount of capital to ensure them have the ability deal with the risk. However, banking developed so fast in China, the high increase in equity could just keep up with the growth rate of assets. ICBC has been the first bank in the world according to its assets, while it still has a higher equity multiplier than average equity multiplier in American banking.

Banks in the United States have an average equity multiplier around 10, which showed the great control on the financial leverage. From 2008 to 2012, all these banks didn't have obvious increase on its asset, while they sustainably increased their equity to adapt the complex market environment.

4.4.2 Risk index of selected banks

Risk index is known as *RI*, which indicate the performance of assets and liabilities management and we can compute this ratio by formula (3.19). See Figure 4.11.

Figure 4.11: RI of selected banks



All Banks were seeking a high value on *RI*, which it means more capable to resist risks. The highest *RI* of 112.28 was achieved by Bank of China in 2012, while it had already reached 110 in 2011. The lowest *RI* of 8.08 was reached by Citi in 2008.

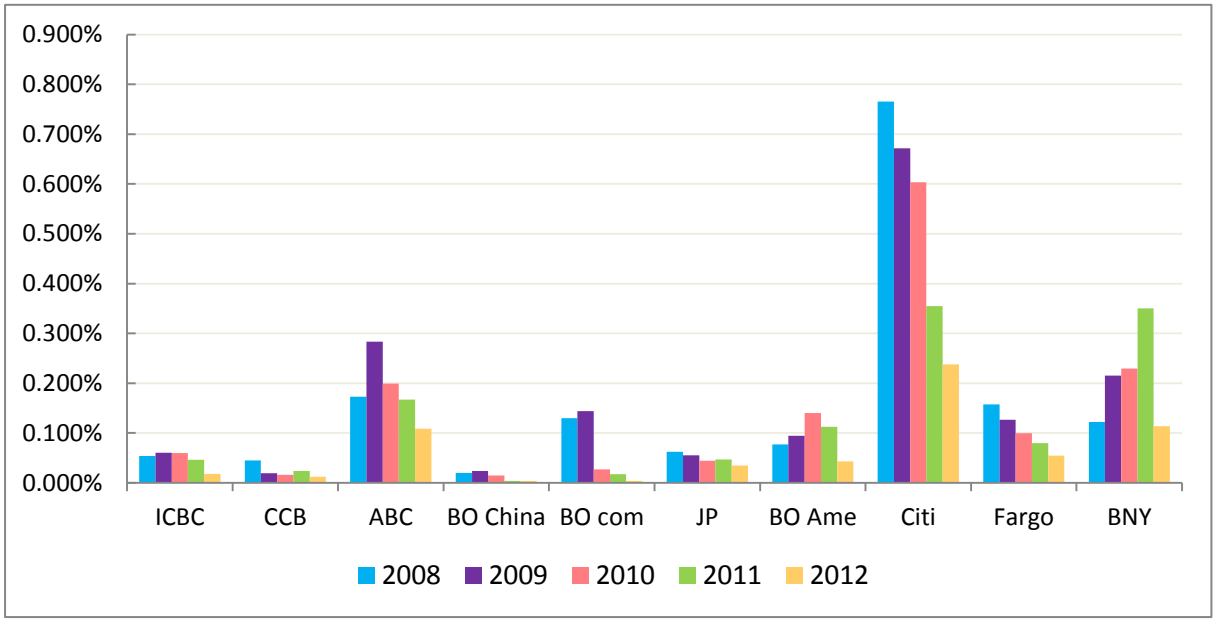
ABC kept stable around 20, which was the last in Chinese banks, mainly because they had a quite low expected *ROA* and relative high volatility of assets returns. ICBC and CCB were slowly increasing with an approach close to 60, which was primarily due to the continuous increase on expected *ROA* and the volatility of assets returns reduced simultaneously. Bank of China and Bank of Communications made a rapid growth on *RI* from 60 to 110 were profoundly affected by the big decrease in volatility of assets returns with the sustainable increase on expected *ROA*.

Banks in America mainly had an average *RI* of 20, while JP was the best nearly 30 and Citi just got 10. Even though there was a new high achieved by each bank in the end of 2012, they can hardly improve *RI* which was mainly due to the sharp decrease on expected *ROA* and the quite high volatility of assets returns.

4.4.3 Probability of financial insolvency of selected banks

Probability of financial insolvency, known as *P(BV)*, measures the probability that a bank will have negative book value of equity. And we can compute *P(BV)* by formula (3.20). See Figure 4.12.

Figure 4. 12: P(BV) of selected banks



Even though the probability of financial insolvency for these ten banks was lower than 0.8%, there existed big difference from bank to bank. The highest *P(BV)* of 0.765% was achieved

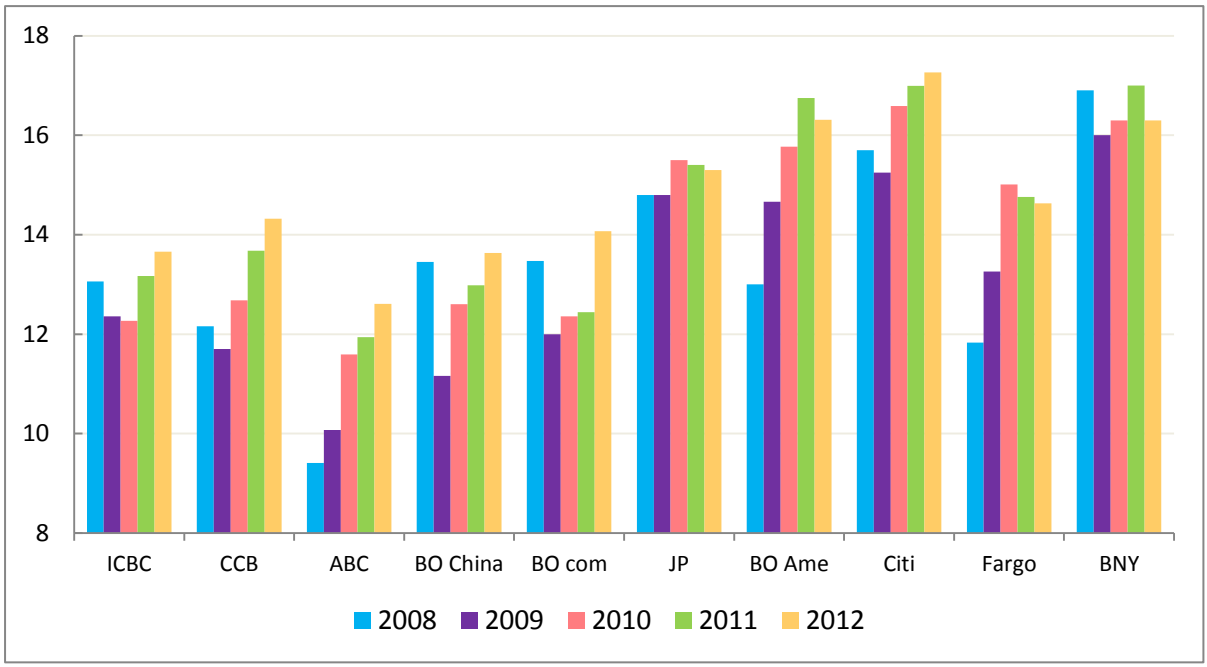
by Citi in 2008 which was mainly caused by the negative *ROA* due to the loss of interest rate contracts and credit derivatives from principle transactions. And the lowest *P(BV)* of 0.004% was achieved twice by Bank of China both in 2011 and 2012 and once by Bank of Communications in 2012.

This figure reflected the financial stability in a different side from *RI*. It's no doubt that CCB, Bank of China and Bank of communications had a low *P(BV)* while they had big *RI*, but ICBC, JP, Bank of America and Fargo which had a low *RI* got a quite low *P(BV)* too. That was mainly due to the low and stable value in volatility of assets returns.

4.4.4 Capital adequacy ratio of selected banks

Capital adequacy ratio is known as *CAR*, which reflects the degree a bank can absorb the losses by using their own capital when a bank suffers losses and we can compute this ratio by formula (3.21). See Figure 4.13.

Figure 4.13: CAR of selected banks



The pillars belong to banks in the United States were obviously higher than the pillars of Chinese banks, which means the capital banks can use as a cushion in US was more stable. According to Basel Accord, the minimum *CAR* is 8%. The highest *CAR* of 17.26% was achieved by Citi in 2012, while the lowest *CAR* of 9.41% was from ABC in 2008.

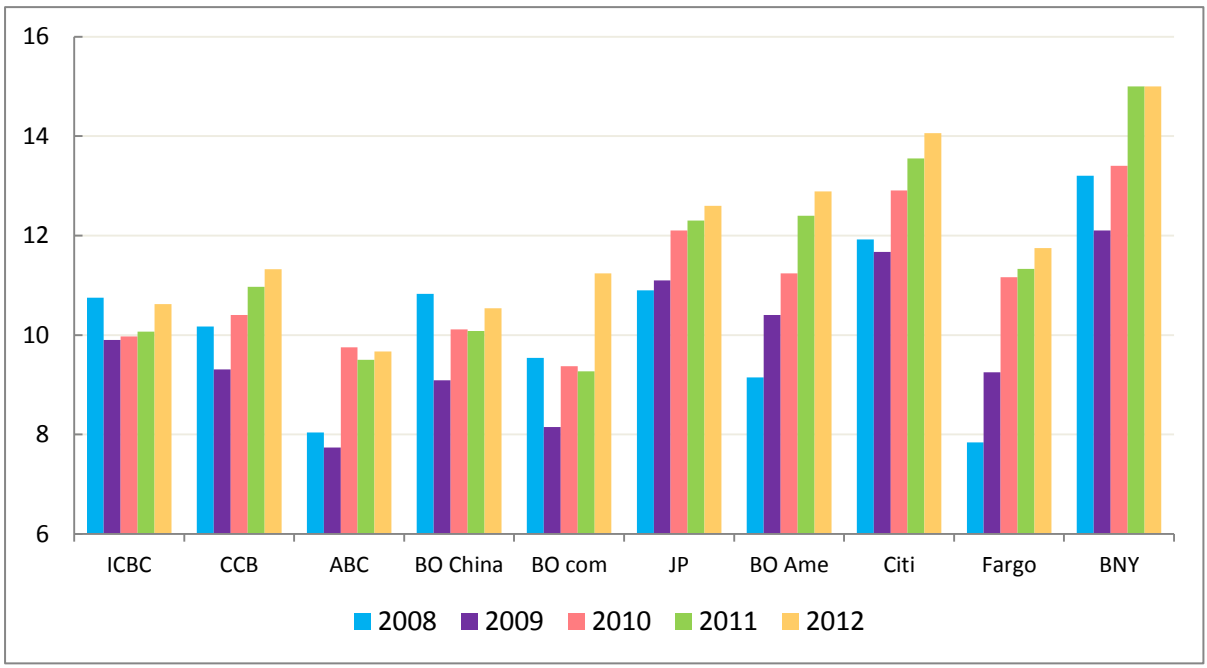
The Banks in China had an average *CAR* around 13% except ABC. There was a clear trend that Chinese banks paid more attention to the structure of its regulatory capital and risk weighted assets, while *CAR* all reached a new high point at the end of 2012. And ABC increased its *CAR* continuously from 9.41% in 2008 to 12.61% in 2012, mainly because the bank's profit increased steadily, effectively replenished its core capital and the bank issued subordinated bonds, all of which were used to replenish supplementary capital and the growth of risk weighted assets was effectively kept under control. CBRC improved the regulatory requirements on *CAR* which in domestic systematically important banks shall not be lower 11.5% in June, 2012. And they all fulfilled the requirements.

American banks got an average *CAR* around 15% and the values were always increasing, either by declining in risk weighted assets in Bank of America, or by increasing in qualifying perpetual preferred stock in Citi. BNY had an obvious decrease in 2012 was mainly due to the increase in risk weighted assets driven by higher investment securities, loans and interest bearing deposits with banks. As regulated by the Federal Reserve, OCC and FDIC, the well capitalized standard of *CAR* for consolidated financial holding company was 10%. Obviously, none of them had this problem.

4.4.5 Core capital adequacy ratio of selected banks

Core capital adequacy ratio is known as Core *CAR*, which measures a bank's core equity capital to its total risk weighted assets and we can compute this ratio by formula (3.22). See Figure 4.14.

Figure 4.14: Core CAR of selected banks



There was a clear growing trend for each bank, which indicated banks were all increasing their core capital to deal with risk. Core *CAR* in Chinese banks were close to 10% and that in American banks were around 12%. The highest Core *CAR* was 15% unchanged in BNY at both 2011 and 2012, which was due to earnings retention and the issuance noncumulative perpetual preferred stock, net of issuance costs were offset by share repurchases, the repayment of trust preferred securities and higher risk weighted assets. And the lowest Core *CAR* was 7.79% in ABC at 2009, which was because of the rapid development of its businesses, the accelerated expansion of its assets and significant growth of its risk weighted assets. Even they enhanced the capital base through retained profits and issuance of subordinated bonds, the increase speed was slower than that of risk weighted assets. And according to Basel Accord, the minimum Core *CAR* is 4%, while the updated regulation requirement for Core *CAR* was 9.5% in China and it was 6% in the United States.

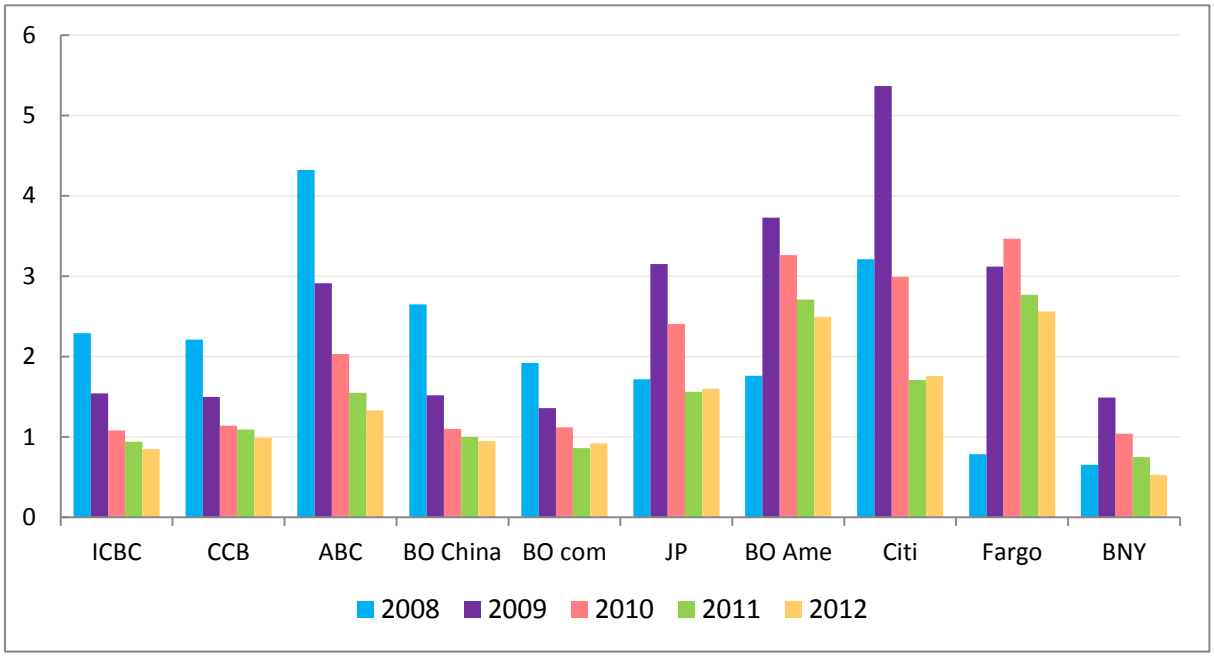
4.5 Asset quality ratios

Asset quality ratios are ratios reflecting the stability of assets in case of a risk, especially credit risk, which has the most important influence on banks' operation.

4.5.1 Nonperforming loans ratio of selected banks

Nonperforming loans ratio, known as *NPL* ratio which shows the relationship between nonperforming loans and total loans and we can compute this ratio by formula (3.23). See Figure 4.15.

Figure 4.15: NPL of selected banks



There was a clear downward trend in *NPL* ratio for each bank. The highest *NPL* ratio of 5.37% was created by Citi in 2009, while the lowest *NPL* ratio of 0.53% was reached by BNY in 2012. The less *NPL* ratio of a bank, the more stable and efficient a bank is.

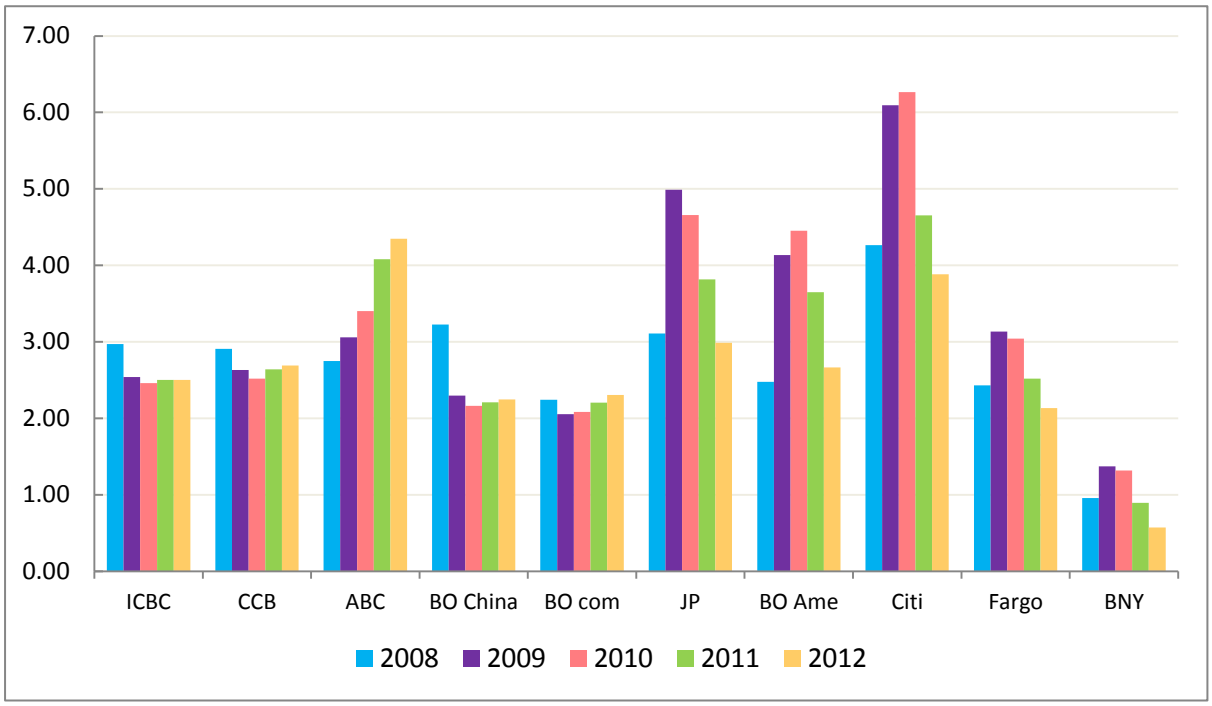
Chinese banks had a sharp decrease in *NPL* ratio from 2008 to 2012, most of them decreased from a 2% level to a 1% level, while ABC decreased from 4.32% to 1.33%, which was a result of enhanced credit management, stricter access standards, tightened control of nonperforming loans and intensified recovery and disposal of nonperforming loans.

In America, *NPL* ratio in each bank increased rapidly from 2008 to 2009 which was mainly the increase of nonperforming loans on residential mortgage due to the impacts of the weak housing markets and economic conditions. After that there was a clear trend of reducing in nonperforming loans which was mainly from the repayments of portfolios, only the *NPL* ratio in 2012 was not as low as that in China.

4.5.2 Allowance to total loans ratio of selected banks

Allowance to total loans ratio measures the relationship between allowance for loan losses and total loans and we can compute this ratio by formula (3.25). See Figure 4.16.

Figure 4.16: Allowance to total loans ratio of selected banks



Allowance to total loans ratio changed from country to county. The highest allowance to total loans ratio of 6.27% was reached by Citi in 2010, and the lowest allowance to total loans ratio of 0.57% was achieved by 2012.

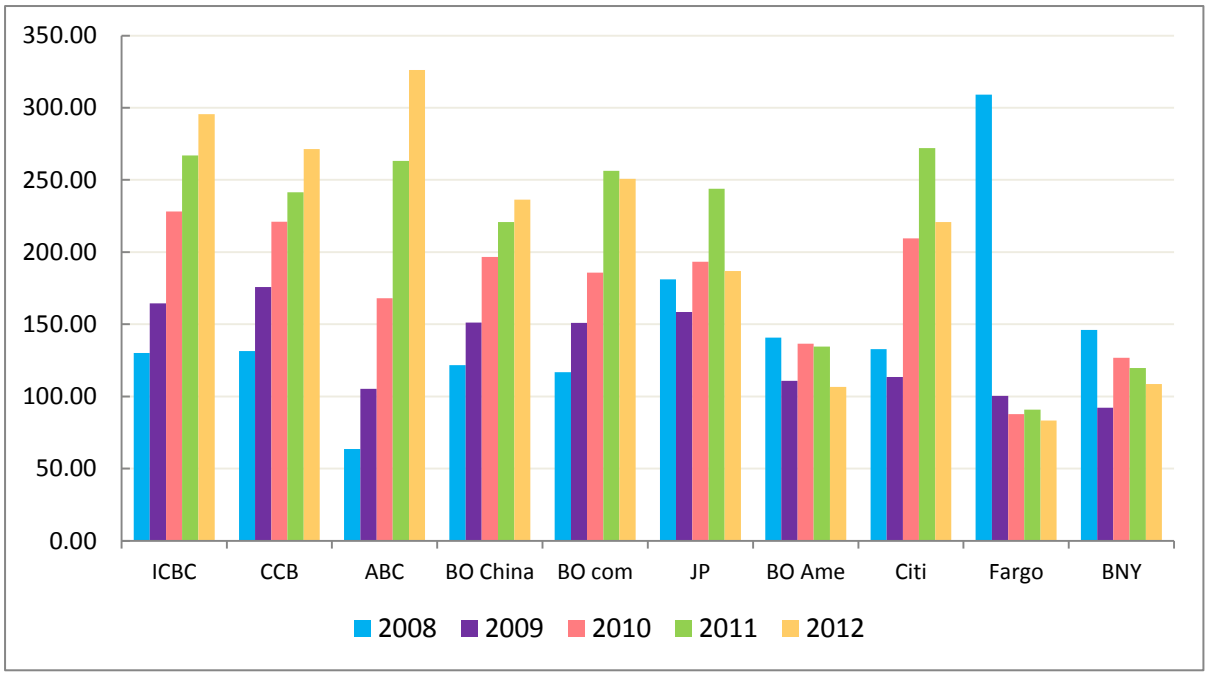
In China, banks had a stable and slow growing trend on allowance to total loans ratio, while ICB and CCB were around 2.5%, Bank of China and Bank of Communications were around 2%, and ABC leaded the way in its domestic industry with a rapid growth from 2.75% in 2008 to 4.35% in 2012 which was mainly due to the increase the balance of allowance for loan losses assessed on a collective basis in order to strengthen its capability of resisting risks.

American banks increased allowance to total loans ratio in 2009, mainly because they increased the allowance for residential mortgage due to the impacts of the weak housing markets and economic conditions. Then, allowance to total loans ratio decreased gradually, like Citi dropped from 6.27% to 3.88%, which reflected overall continued improvement in the credit quality of loan portfolios.

4.5.3 Coverage ratio of selected banks

Coverage ratio measures the degree of allowance for loan losses to nonperforming loans and we can compute this ratio by formula (3.26). See Figure 4.17.

Figure 4.17: Coverage ratio of selected banks



We can find out the two totally different development trend in the figure, while Chinese banks were seeking a higher and higher coverage ratio, banks in America had a decrease on coverage ratio. The highest and lowest coverage ratio was both achieved by ABC, respectively, as 63.53% in 2008 and 326.14% in 2012. And ABC's coverage ratio increased continuously from 2008 to 2012.

The same increasing trend occurred to other Chinese banks. They strengthened credit risk prevention and control by refining industry specific credit policies, industry specific credit limits and list based management and reinforced in depth risk inspection, monitoring and warning systems. Due to all these factors, they made an enormous growth on coverage ratio. And Central Bank also requires the banks to keep a minimum coverage ratio of 100%.

Coverage ratio in banks from the United States fluctuated a lot, while JP and Citi had an average of 175% and leaded in the domestic industry, Bank of America and BNY decreased a lit bit to around 100%. Fargo had an extreme drop from 309.01% in 2008 to 100.4% in 2009,

which was affected by some deterioration in the underlying loan portfolio. And Citi had an increase in from 2009 to 2011, which was mainly due to the decrease in nonperforming loans caused by the repayments of portfolios.

4.6 Summary

Every business pursues a good earning ability and a stable assets structure to resist risk, especially banking which is making business on credit. In this chapter, we chose profitability ratios and activity ratios to assess banks' earning ability, while we chose financial leverage ratios and asset quality ratios to evaluate banks' stability.

From the figures illustrated above, we can find out the five banks we chose from China usually had the same developing trend and there was only a little bit difference in each values. What's more, the situation for Chinese banking is better and better which is because nearly all the figures were approaching to a good level stably and continuously. Meanwhile, the other five banks we chose from the United States were different from each other no matter in developing trend or in the absolute value.

Chinese banks were known as the most profitable banks in the world, which was indeed worthy of the name. None of Chinese banks suffered a loss during the chosen five years, from 2008 to 2012; while three banks suffered loss expect JP and Fargo from different reasons. Bank of America got a net loss in 2010 primarily due to an increase in representations and warranties provision and a goodwill impairment charge; Citi suffered loss both in 2008 and 2009, which was mainly caused by the loss of interest rate contracts and credit derivatives from principle transactions; BNY reached a negative net income in 2009 which was primarily resulted from a charge related to restructuring the investment securities portfolio.

And if we pay close attention to the profitability ratios, we will find out that Chinese banks leaded in *ROA* and *ROE* with an average around 1% and 20%, respectively, and there was a stable and growing trend. At the same time, American banks went ups and downs, fluctuated a lot. Chinese banks also had a good control on net interest margin around 2.3%, which was affected by the increase in interest rate from the Central Bank and banks' the strong pricing capability, while their assets all doubled from 2008 to 2012. However, banks from the United States had a decrease on net interest margin which was largely driven by strong deposit

growth, which elevated short term investment balances, and the continued runoff of higher yielding assets.

Benefiting from the mixed operation of commercial bank and investment bank, American banks had more sources for noninterest income which resulted in its absolute advance in net noninterest margin. Despite the facts that the lower securities gains, lower principal transactions revenue and declines in equity and debt underwriting fees made a downward trend in net noninterest margin, American banks still had a quite high level of net noninterest margin around 1.5%, while banks from Chinese were slowing improving its earning ability on net noninterest margin with a 0.5% level.

Fargo was the winner when we combine the net interest margin and net noninterest margin, which showed in net operating margin with a high 2.5% level while other American banks were losing net operating margin and Chinese banks were around the level of 1.5%. And this performance also existed in asset turnover.

From operating efficiency ratio and net profit margin, we can find out Chinese banks all had a good control on its cost, which means they use less operating expense to create more operating income and get a large percent back from operating income. Their operating efficiency ratios were around 50% and their net profit margins were around 40%.These results were mainly due to strict cost management and control. However, banks from the United States were not able to be so effective, either due to the increase in provisions for impairment losses, or decrease from principle transactions.

With the deepening of globalization, the global economic and financial situation becomes complicated, international financial markets fluctuate frequently. It's good for banking with an adequate financial leverage which means good combination of equity and liabilities. And well capitalized banks can definitely use its cushion of its own capital to resist risk.

The trends were the same in decreasing equity multiplier, increasing *CAR* and increasing Core *CAR* for both Chinese banks and American banks. It was a strong signal that banks were all seeking for more equity to fund their assets and resist risk. Banks from the Unites States were quite advanced with equity multiplier around 10, *CAR* around 15 and Core *CAR* around 12, than Chinese banks with equity multiplier around 15, *CAR* around 12 and Core *CAR* around 10. Banks replenished their core capital from earnings retention and issuance of

preferred stock, replenished supplementary capital through issuing subordinated bonds and effectively kept the growth of risk weighted assets under control.

From the figure of RI, we know that Bank of China and Bank of Communication were going to the level of strong banks. These two banks made a rapid growth on *RI* from 60 to 110 were profoundly affected by the big decrease in volatility of assets returns with the sustainable increase on expected *ROA*. All other banks had low *RI* value, which means they had a poor result on assets and liabilities management.

If a bank has a large part of *NPL* to its total loans, it would have problem in its asset structure and affect the overall stability. Thanks to the regulatory restriction on commercial bank business, the banks in China focused more on the *NPL* ratio than the banks from the United States which were mix operated. There was a simultaneous declining trend for all banks. At the end of 2012, all Chinese banks control the *NPL* ratio close to 1%, which was a result of enhanced credit management, stricter access standards, tightened control of nonperforming loans and intensified recovery and disposal of nonperforming loans, while *NPL* ratio changed from bank to bank in America, almost beyond 2% except BNY.

Allowance to total loans ratio in America had a clear downward trend, which was due to overall continued improvement in the credit quality of loan portfolios, while that in Chinese banks was around 2.5% and increasing year by year. Due to the control of allowance and nonperforming loans, there was an enormous increase in coverage ratio of Chinese banks which was exceeding 250%, while the American banks kept it around 100%. The higher the coverage ratio, the thicker the cushion is in case of adverse event. And Banks could smooth its earning over a period of time.

All in all, Chinese banks are more profitable and pay more attention on its loans than American banks, while American banks are better capitalized than Chinese banks to resist risk.

5 Conclusion

Banking has been profoundly affected by the complicated global economic and financial situation and the fluctuated international financial markets. Banking competition becomes more intense, not only from domestic and international banks, but also from other financial intermediaries like the insurance companies or the pension funds. In this special time, it's more important for a bank to own a good earning ability and a stable assets structure to resist risk.

The aim of this thesis is to compare selected banks efficiency in China and the United States of America from 2008 to 2012. And there are five parts in the thesis. In the first part, we briefly introduce the procedures of the thesis. In the second part, we describe the core functions, the evolution from past to now and the types of banking. In order to have a good understanding of the banks which to be compared later, we introduce the banking structure and regulation in the two countries. In the third part, we take a close look at the commonly used financial ratios. In the fourth part, we choose five banks from each country according to the assets size, then, we illustrate the main performances achieved by banks in ratio from 2008 to 2012 and compare the differences.

In the fifth part, we get a conclusion about the efficiency in China and the United States that Chinese banks are more profitable and pay more attention to its loans than American banks, while American banks are better capitalized than Chinese banks to resist risk. As all the figures illustrated in front, we know that Chinese banks are operating in a stable and profitable way, which means nearly all relative ratios are approaching in a good level. And due to the excellent profitability in the world, Chinese banks can expect a higher market share in the future. What's more, it would always easier for a bank with strong profitability to replenish capital. In turn, it will improve the stability of banks' assets. In spite of the fact that Chinese banks can only focus on commercial banking business, they have already achieved big profit. With the deepening of economic reform in China, especially in banking area, Chinese banks will have more opportunities than banks in the United States. And once mixed operation of commercial banking business and investment banking business is allowed, we can expect a more stable and more profitable Chinese banking. Chinese banks do have a better efficiency than banks in the United States, no matter now or in the future.

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List of abbreviations

ABC	Agricultural Bank of China
BNY	Bank of New York Mellon
BO Ame	Bank of America
BO China	Bank of China
BO com	Bank of Communications
CAR	Capital adequacy ratio
CCB	China Construction Bank
Citi	Citigroup
Fargo	Wells Fargo
ICBC	Industrial and Commercial Bank
JP	JPMorgan Chase
LTD	Loan to deposit
NPL	Nonperforming loans
P(BV)	Probability of financial insolvency
ROA	Return on assets
ROE	Return on equity
RI	Risk index

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Ostrava dated 25.04.2014

Kai Liu

List of Annexes

Annex 1 Performances for ICBC and CCB from 2008 to 2012

Bank	ICBC RMB millions					CCB RMB millions				
Year	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
net interest income	263,037	245,821	303,749	362,764	417,828	224,920	211,885	251,500	304,572	353,202
net noninterest income	44,002	55,147	72,840	101,550	106,064	38,446	48,059	66,132	86,994	93,507
total operating income	310,195	309,411	380,748	470,601	529,720	269,747	269,314	325,780	399,403	462,533
total operating expense	111,335	120,819	139,480	169,613	189,940	99,193	105,146	121,366	144,537	171,081
net income	111,226	129,396	166,025	208,445	238,691	92,642	106,836	135,031	169,439	193,602
Assets	9,757,146	11,785,053	13,458,622	15,476,868	17,542,217	7,555,452	9,623,355	10,810,317	12,281,834	13,972,828
Liabilities	9,150,516	11,106,119	12,636,965	14,519,045	16,413,758	7,087,890	9,064,335	10,109,412	11,465,173	13,023,219
Equity	606,630	678,934	821,657	957,823	1,128,459	467,562	559,020	700,905	816,661	949,609
ROA	1.14%	1.10%	1.23%	1.35%	1.36%	1.23%	1.11%	1.25%	1.38%	1.39%
ROE	18.34%	19.06%	20.21%	21.76%	21.15%	19.81%	19.11%	19.27%	20.75%	20.39%
Net interest margin	2.70%	2.09%	2.26%	2.34%	2.38%	2.98%	2.20%	2.33%	2.48%	2.53%
Net noninterest margin	0.45%	0.47%	0.54%	0.66%	0.60%	0.51%	0.50%	0.61%	0.71%	0.67%
Net operating margin	2.04%	1.60%	1.79%	1.94%	1.94%	2.26%	1.71%	1.89%	2.08%	2.09%
Net profit margin	35.86%	41.82%	43.60%	44.29%	45.06%	34.34%	39.67%	41.45%	42.42%	41.86%
Asset turnover	3.18%	2.63%	2.83%	3.04%	3.02%	3.57%	2.80%	3.01%	3.25%	3.31%
Operating efficiency	35.89%	39.05%	36.63%	36.04%	35.86%	36.77%	39.04%	37.25%	36.19%	36.99%
Equity multiplier	16.08	17.36	16.38	16.16	15.55	16.16	17.21	15.42	15.04	14.71
CAR	13.06	12.36	12.27	13.17	13.66	12.16	11.70	12.68	13.68	14.32
Core CAR	10.75	9.90	9.97	10.07	10.62	10.17	9.31	10.40	10.97	11.32
NPL ratio	2.29	1.54	1.08	0.94	0.85	2.21	1.50	1.14	1.09	0.99
Allowance to total loans	2.97	2.54	2.46	2.5	2.5	2.91	2.63	2.52	2.64	2.69
Coverage ratio	130.15	164.41	228.20	266.92	295.55	131.58	175.77	221.14	241.44	271.29

Annex 2 Performances for ABC and Bank of China from 2008 to 2012

Bank	ABC RMB millions					BO China RMB millions				
Year	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
net interest income	200,003	181,639	242,152	307,199	341,879	162,936	158,881	193,962	228,064	256,964
net noninterest income	23,798	35,640	46,128	68,750	74,844	65,869	73,689	82,556	100,234	109,212
total operating income	214,011	223,589	292,319	379,834	425,009	228,805	232,570	276,518	328,298	366,176
total operating expense	110,175	109,567	128,107	157,330	182,802	97,749	107,307	122,409	140,815	160,022
net income	51,453	65,002	94,907	121,956	145,131	65,560	85,531	109,820	130,502	145,522
Assets	7,014,351	8,882,588	10,337,406	11,677,577	13,244,342	6,955,594	8,751,794	10,459,703	11,829,789	12,680,615
Liabilities	6,723,810	8,539,663	9,795,170	11,027,789	12,492,988	6,460,894	8,205,392	9,782,441	11,072,652	11,819,073
Equity	290,541	342,925	542,236	649,788	751,354	494,700	546,402	677,262	757,137	861,542
ROA	0.73%	0.73%	0.92%	1.04%	1.10%	0.94%	0.98%	1.05%	1.10%	1.15%
ROE	17.71%	18.96%	17.50%	18.77%	19.32%	13.25%	15.65%	16.22%	17.24%	16.89%
Net interest margin	2.85%	2.04%	2.34%	2.63%	2.58%	2.34%	1.82%	1.85%	1.93%	2.03%
Net noninterest margin	0.34%	0.40%	0.45%	0.59%	0.57%	0.95%	0.84%	0.79%	0.85%	0.86%
Net operating margin	1.48%	1.28%	1.59%	1.91%	1.83%	1.88%	1.43%	1.47%	1.58%	1.63%
Net profit margin	24.04%	29.07%	32.47%	32.11%	34.15%	28.65%	36.78%	39.72%	39.75%	39.74%
Asset turnover	3.05%	2.52%	2.83%	3.25%	3.21%	3.29%	2.66%	2.64%	2.78%	2.89%
Operating efficiency	51.48%	49.00%	43.82%	41.42%	43.01%	42.72%	46.14%	44.27%	42.89%	43.70%
Equity multiplier	24.14	25.90	19.06	17.97	17.63	14.06	16.02	15.44	15.62	14.72
CAR	9.41	10.07	11.59	11.94	12.61	13.45	11.16	12.60	12.98	13.63
Core CAR	8.04	7.74	9.75	9.50	9.67	10.83	9.09	10.11	10.08	10.54
NPL ratio	4.32	2.91	2.03	1.55	1.33	2.65	1.52	1.10	1.00	0.95
Allowance to total loans	2.75	3.06	3.4	4.08	4.35	3.23	2.30	2.16	2.21	2.24
Coverage ratio	63.53	105.37	168.05	263.10	326.14	121.72	151.17	196.67	220.75	236.30

Annex 3 Performances for Bank of Communications and JP from 2008 to 2012

Bank	BO Communication RMB millions					JP Morgan USD millions				
Year	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
net interest income	65,862	66,668	84,995	103,493	120,126	38,779	51,152	51,001	47,689	44,910
net noninterest income	8,837	11,399	14,479	18,657	20,882	5,727	22,354	23,569	20,508	21,536
total operating income	77,276	81,578	104,743	127,795	148,184	44,506	73,506	74,570	68,197	66,446
total operating expense	30,633	32,022	42,543	49,863	58,435	20,754	25,424	33,072	33,874	34,144
net income	28,621	30,254	39,172	50,817	58,476	5,605	11,728	17,370	18,976	21,284
Assets	2,678,249	3,309,137	3,951,593	4,611,177	5,273,379	2,175,052	2,031,989	2,117,605	2,265,792	2,359,141
Liabilities	2,532,649	3,144,712	3,727,936	4,338,389	4,891,932	2,008,168	1,866,624	1,941,499	2,082,219	2,155,072
Equity	145,600	164,425	223,657	272,788	381,447	166,884	165,365	176,106	183,573	204,069
ROA	1.07%	0.91%	0.99%	1.10%	1.11%	0.26%	0.58%	0.82%	0.84%	0.90%
ROE	19.66%	18.40%	17.51%	18.63%	15.33%	3.36%	7.09%	9.86%	10.34%	10.43%
Net interest margin	2.46%	2.01%	2.15%	2.24%	2.28%	1.78%	2.52%	2.41%	2.10%	1.90%
Net noninterest margin	0.33%	0.34%	0.37%	0.40%	0.40%	0.26%	1.10%	1.11%	0.91%	0.91%
Net operating margin	1.74%	1.50%	1.57%	1.69%	1.70%	1.09%	2.37%	1.96%	1.51%	1.37%
Net profit margin	37.04%	37.09%	37.40%	39.76%	39.46%	12.59%	15.96%	23.29%	27.83%	32.03%
Asset turnover	2.89%	2.47%	2.65%	2.77%	2.81%	2.05%	3.62%	3.52%	3.01%	2.82%
Operating efficiency	39.64%	39.25%	40.62%	39.02%	39.43%	46.63%	34.59%	44.35%	49.67%	51.39%
Equity multiplier	18.39	20.13	17.67	16.90	13.82	13.03	12.29	12.02	12.34	11.56
CAR	13.47	12.00	12.36	12.44	14.07	14.8	14.8	15.5	15.4	15.3
Core CAR	9.54	8.15	9.37	9.27	11.24	10.9	11.1	12.1	12.3	12.6
NPL ratio	1.92	1.36	1.12	0.86	0.92	1.72	3.15	2.41	1.56	1.60
Allowance to total loans	2.24	2.05	2.08	2.20	2.31	3.11	4.99	4.66	3.81	2.99
Coverage ratio	116.83	151.05	185.84	256.37	250.68	181.25	158.42	193.42	244.00	186.94

Annex 4 Performances for Bank of America and Citi from 2008 to 2012

Bank	Bank of America USD millions					Citigroup USD millions				
Year	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
net interest income	45,360	47,109	51,523	44,616	40,656	53,749	48,914	54,652	48,447	47,603
net noninterest income	9,051	41,006	23,548	11,873	7,030	-33,246	6,384	7,519	4,218	-2,634
total operating income	54,411	88,115	75,071	56,489	47,686	20,503	55,298	62,171	52,665	44,969
total operating expense	23,158	35,185	47,959	43,309	36,445	38,144	22,835	22,945	25,245	25,314
net income	4,008	6,276	-2,238	1,446	4,188	-28,027	-1,511	10,883	11,215	7,760
Assets	1,817,943	2,230,232	2,264,909	2,129,046	2,209,974	1,938,470	1,856,646	1,913,902	1,873,878	1,864,660
Liabilities	1,640,891	1,998,788	2,036,661	1,898,945	1,973,018	1,794,448	1,701,673	1,748,113	1,694,305	1,673,663
Equity	177,052	231,444	228,248	230,101	236,956	144,022	154,973	165,789	179,573	190,997
ROA	0.22%	0.28%	-0.10%	0.07%	0.19%	-1.45%	-0.08%	0.57%	0.60%	0.42%
ROE	2.26%	2.71%	-0.98%	0.63%	1.77%	-19.46%	-0.98%	6.56%	6.25%	4.06%
Net interest margin	2.50%	2.11%	2.27%	2.10%	1.84%	2.77%	2.63%	2.86%	2.59%	2.55%
Net noninterest margin	0.50%	1.84%	1.04%	0.56%	0.32%	-1.72%	0.34%	0.39%	0.23%	-0.14%
Net operating margin	1.72%	2.37%	1.20%	0.62%	0.51%	-0.91%	1.75%	2.05%	1.46%	1.05%
Net profit margin	7.37%	7.12%	-2.98%	2.56%	8.78%	-136.70%	-2.73%	17.50%	21.29%	17.26%
Asset turnover	2.99%	3.95%	3.31%	2.65%	2.16%	1.06%	2.98%	3.25%	2.81%	2.41%
Operating efficiency	42.56%	39.93%	63.88%	76.67%	76.43%	186.04%	41.29%	36.91%	47.94%	56.29%
Equity multiplier	10.27	9.64	9.92	9.25	9.33	13.46	11.98	11.54	10.44	9.76
CAR	13	14.66	15.77	16.75	16.31	15.7	15.25	16.59	16.99	17.26
Core CAR	9.15	10.4	11.24	12.4	12.89	11.92	11.67	12.91	13.55	14.06
NPL ratio	1.76	3.73	3.26	2.71	2.50	3.21	5.37	2.99	1.71	1.76
Allowance to total loans	2.48	4.13	4.45	3.65	2.66	4.27	6.09	6.27	4.65	3.88
Coverage ratio	140.81	110.91	136.48	134.57	106.73	132.83	113.53	209.49	272.09	220.79

Annex 5 Performances for Fargo and BNY from 2008 to 2012

Bank	Wells Fargo USD millions					BNY Mellon USD millions				
Year	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
net interest income	25,143	46,324	44,757	42,763	43,230	2,859	2,915	2,925	2,984	2,973
net noninterest income	8,474	28,605	26,584	23,723	28,167	7,153	5,408	5,482	5,772	5,470
total operating income	33,617	74,929	71,341	66,486	71,397	10,012	8,323	8,407	8,756	8,443
total operating expense	14,338	35,263	36,587	34,931	35,709	6,334	10,199	4,955	5,386	5,572
net income	2,698	12,667	12,663	16,211	19,368	1,443	-1,083	2,581	2,569	2,523
Assets	1,309,639	1,243,646	1,258,128	1,313,867	1,422,968	237,512	212,224	247,259	325,266	358,990
Liabilities	1,207,323	1,129,287	1,130,239	1,172,180	1,264,057	209,423	183,221	214,102	291,065	321,548
Equity	102,316	114,359	127,889	141,687	158,911	28,089	29,003	33,157	34,201	37,442
ROA	0.21%	1.02%	1.01%	1.23%	1.36%	0.61%	-0.51%	1.04%	0.79%	0.70%
ROE	2.64%	11.08%	9.90%	11.44%	12.19%	5.14%	-3.73%	7.78%	7.51%	6.74%
Net interest margin	1.92%	3.72%	3.56%	3.25%	3.04%	1.20%	1.37%	1.18%	0.92%	0.83%
Net noninterest margin	0.65%	2.30%	2.11%	1.81%	1.98%	3.01%	2.55%	2.22%	1.77%	1.52%
Net operating margin	1.47%	3.19%	2.76%	2.40%	2.51%	1.55%	-0.88%	1.40%	1.04%	0.80%
Net profit margin	8.03%	16.91%	17.75%	24.38%	27.13%	14.41%	-13.01%	30.70%	29.34%	29.88%
Asset turnover	2.57%	6.02%	5.67%	5.06%	5.02%	4.22%	3.92%	3.40%	2.69%	2.35%
Operating efficiency	42.65%	47.06%	51.28%	52.54%	50.01%	63.26%	122.54%	58.94%	61.51%	66.00%
Equity multiplier	12.80	10.87	9.84	9.27	8.95	8.46	7.32	7.46	9.51	9.59
CAR	11.83	13.26	15.01	14.76	14.63	16.9	16	16.3	17	16.3
Core CAR	7.84	9.25	11.16	11.33	11.75	13.2	12.1	13.4	15	15
NPL ratio	0.79	3.12	3.47	2.77	2.56	0.65	1.49	1.04	0.75	0.53
Allowance to total loans	2.43	3.13	3.04	2.52	2.13	0.96	1.37	1.32	0.90	0.57
Coverage ratio	309.01	100.40	87.73	90.93	83.28	146.13	92.12	126.72	119.76	108.57

Annex 6 risk index, probability of financial insolvency and LTDfrom 2008 to 2012

RI										
	ICBC	CCB	ABC	BO China	BO com	JP	BO Ame	Citi	Fargo	BNY
2008	30.44	33.38	17.02	50.33	19.62	28.27	25.49	8.08	17.82	20.24
2009	28.73	51.09	13.29	46.02	18.65	30.02	22.98	8.63	19.87	15.23
2010	28.94	56.33	15.83	57.66	43.28	33.60	18.90	9.10	22.40	14.76
2011	32.85	46.01	17.29	110.00	54.22	32.63	21.09	11.88	25.09	11.95
2012	52.45	63.76	21.45	112.28	112.12	38.15	34.00	14.50	30.23	20.94

P(BV)										
	ICBC	CCB	ABC	BO China	BO com	JP	BO Ame	Citi	Fargo	BNY
2008	0.054%	0.045%	0.173%	0.020%	0.130%	0.063%	0.077%	0.765%	0.157%	0.122%
2009	0.061%	0.019%	0.283%	0.024%	0.144%	0.055%	0.095%	0.672%	0.127%	0.216%
2010	0.060%	0.016%	0.199%	0.015%	0.027%	0.044%	0.140%	0.604%	0.100%	0.229%
2011	0.046%	0.024%	0.167%	0.004%	0.017%	0.047%	0.112%	0.354%	0.079%	0.350%
2012	0.018%	0.012%	0.109%	0.004%	0.004%	0.034%	0.043%	0.238%	0.055%	0.114%

Loan-to-deposit ratio										
	ICBC	CCB	ABC	BO China	BO com	JP	BO Ame	Citi	Fargo	BNY
2008	56.40%	59.50%	50.84%	63.99%	65.29%	73.81%	105.49%	89.67%	110.68%	27.18%
2009	59.50%	60.25%	55.19%	72.04%	71.97%	67.51%	90.77%	70.76%	94.99%	27.17%
2010	62.00%	62.47%	55.77%	71.72%	72.10%	74.48%	93.07%	76.78%	89.31%	26.01%
2011	63.50%	65.05%	58.61%	68.77%	71.94%	64.17%	89.66%	74.74%	83.65%	20.07%
2012	64.10%	66.23%	59.22%	71.99%	73.20%	61.48%	82.14%	70.44%	79.73%	18.95%